The labour market by education and occupation to 1998

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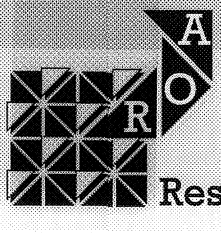

Research Centre for Education and the Labour Market

THE LABOUR MARKET BY EDUCATION AND OCCUPATION TO 1998

ROA-R-1993/10E

RESEARCH CENTRE FOR EDUCATION AND THE LABOUR MARKET

Faculty of Economics and Business Administration
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CONTENTS

FOREWORD

This is the second version of the biannual report *The Labour Market by Education and Occupation,* produced by the Research Centre for Education and the Labour Market (ROA). On this occasion the title has the extension: *to 1998*. The report is based on ROA's Information System on Education and the Labour Market, which is financed by the Ministry of Education and Science, the Central Employment Board (CBA) and the National Career Guidance Information Centre (LDC). The goal of the information system is to provide a picture of the current market position, and some insight into the future market position and the employment risks, of occupations and types of education on the labour market. In addition to the publication of this report and its *statistical appendix,* data from the information system is made accessible through various information packets of the LDC (for example the computerised information system *Traject*, the booklets on *Beroep en werk* (Occupation and Work) and the booklet *Kansen op werk* (chances of employment).

The target audience for this report is in the first instance those who are involved at a policy level with the match between education and the labour market, especially the government, labour supply organisations, the social partners and the educational domain. The report barely touches on the research methods, classifications etc. which have been used. For further information on these points see ROA's specific working papers and research memoranda. The working paper of Dekker, De Grip, Borghans, Matheeuwsen, Wieling and Willems (1993) gives an overall view of the methods and techniques used in this version of the information system. At the end of this report a number of central concepts are summed up and described in more detail, with references to the most recent ROA publications.

In compiling this report considerable use has been made of the Labour Force Survey (EBB) carried out by the Central Bureau of Statistics (CBS). The data presented here therefore relates only to those already working 12 or more hours per week, in accordance with the new definition of the working population. EBB data is available for the period 1988-1992, with the exception of information on education which is only available from 1990 onwards. It should be noted that the CBS has imposed a number of restrictions on the publication of EBB data. It is in part for this reason that no separate data is given for four small occupational classes in which less than 5,000 people are working ('Agricultural engineers', 'Gas and electricity supply technicians', 'Fishermen and shellfish farmers' and 'Veterinary surgeons') or for two small types of education (Higher Vocational Education in 'Theology' and in 'Hotel and Catering'). In addition to this CBS data, much use has been made of forecasting data from the Central Planning Bureau (CPB) and the Ministry of Education and Science. Supplementary up-to-date information on the diverse kinds of Higher Vocational Education has been derived from the results of the *Higher Vocational Education Monitor*.

In the version of the information system on education and the labour market used for this report, a number of important improvements have been introduced, the chief of which is the development of entirely new models for changes in the expansion demand, which take better

account of the reliability of the estimation results. In the education model, furthermore, explicit allowance is made for foreseeable substitution processes in the labour market. In the past year attention has been given to ROA's classification of occupations, resulting in modifications and simplification of the large number of names assigned to occupational classes. The names of the types of education have also been somewhat amended, in particular through the replacement of 'Lower Vocational Education' with a new official term indicating this level: 'Preparatory Vocational Education'.

The development of the Information System on Education and the Labour Market will continue in the coming years, and it will be important to evaluate the forecasts regularly. The results of the first full evaluation study will be published soon. Further development activities will focus, among other things, on improving the models of expansion demand. More efforts will also be made to incorporate data based on two large-scale questionnaire-based research projects, the *Register of the Flows and Destinations of School-leavers (RUBS)* and the *Higher Vocational Education Monitor*. The first exploratory research in this connection has recently been completed. At present a study is also being made of the degree to which it would be possible to generate the labour market information from the EBB in a less aggregated form. This feasibility study relates, for the present, only to technical types of education, but further differentiation at a lower level is also desired for types of education in other fields. In fact the picture for the constituent courses within the types of education which are already differentiated in the information system can vary appreciably.

The report consists of five chapters. In chapter 1 recent changes in the labour market and the expected developments to 1998 are sketched. The heart of the report comes in chapters 2 and 3: chapter 2 deals with future flows on the labour market, and chapter 3 examines the market position of occupations and types of education, considered from both the demand and supply sides of the labour market. Chapter 4 deals with a special theme, different in each biannual report. On this occasion higher education comes under the spotlight. Chapter 5 ends the report with a commentary which examines the significance which the labour market information presented in this report has for five themes which are currently under discussion in educational and labour market policies. The *statistical appendix* gives an overview of the data presented in this report, over the whole of the labour market.

The overall project management of the ROA information system on education and the labour market has been in the hands of Dr. A. de Grip. Other contributions to the information system and/or this report have been made by Dr. L. Borghans, Drs. R.J.P. Dekker, Prof. Dr. J.A.M. Heijke, Drs. A.G.M. Matheeuwsen, Drs. G.W.M. Ramaekers, Drs. M.H. Wieling, Drs. M.R. Wiendels and Drs. E.J.T.A. Willems.

We would like to express our thanks to the members of the Supervisory Commission, which consists of:

Prof. Dr. J.L. Peschar (Chairperson; University of Groningen), Drs. J.W. Altena (Central Bureau of Statistics), Mr H. Daale (Noordelijke Hogeschool, Leeuwarden), Drs. P.C. Van den Dool (Ministry of Education and Science), Drs. G.M.H. Janssen (Ministry of Social Affairs and Employment), Drs. H.J. Roodenburg (Central Planning Bureau), P.W. Van Voorthuijsen (Ministry of Economic Affairs), Drs. J.P. Vosse (Organisation of Labour Market Research), Drs. M. Wegerif (Central Employment Board), Drs. J.M. Van Wissen (Ministry of Agriculture, Conservation and Fisheries), and Drs. G.R. De Wit (National Career Guidance Information Centre).

Maastricht, December 1993

Prof. Dr. J.A.M. Heijke
Director

1. DEVELOPMENTS ON THE LABOUR MARKET

In the past year unemployment in the Netherlands has risen considerably. Increasingly, those with higher education are also becoming victims of the current economic recession. For example, the *Higher Vocational Education Monitor* shows that unemployment among recent graduates from Higher Vocational Education (HBO) has more than doubled in one year (see Van de Loo, Van der Velden and Wieling, 1993). For the present however there are also a limited number of unfilled vacancies.

In this chapter a general picture of the developments in the labour market is outlined. The starting point here is the medium-term forecasts for the Dutch economy compiled by the Central Planning Bureau (CPB, 1993a), from which, in the light of recent economic developments, the more conservative scenario has been chosen. In this scenario there is a rather limited growth in employment. The working population, in this scenario, is expected to grow somewhat faster, resulting in a rise in unemployment.

This chapter provides an overview of the current employment structure, differentiated by economic sectors, occupational sector and educational category. From each of these three perspectives, a description is also given of the expected changes in employment levels in the period 1993-1998. To close this chapter, the future labour market prospects for new entrants to the labour market will be examined, differentiated by categories of education.

Developments in the labour market in the various economic sectors

Table 1.1 gives an overview of the numbers working in each economic sector in 1992. More than 5.8 million people were working at least 12 hours per week.[1] Many of these were working in the commercial or non-commercial service sectors. These two broad sectors provided almost 45% and around 30% of the total employment, respectively.

In past years there has been fairly high employment growth, as expressed in the number of people working. As can be seen from table 1.2, the total number of people working increased over the period 1988-1992 by an average 1.6% per year, although it should be noted that part of this increase is the result of the increasing proportion of workers who work part-time.

The percentage increase in employment has been highest in the sector 'General Commercial Services': the number of people working in this sector increased by an average of 3.7% per year. The 'Transport and Communication' and 'Non-commercial Services' sectors have enjoyed strong growth of around 2% per year. There has been a reduction in the numbers working in four sectors in the period 1988-1992. The largest fall in employment has occurred in the 'Agriculture, Fisheries and Forestry' sector, although employment in the 'Energy' sector has

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1. The official definition of the working population includes only those who work at least 12 hours per week.

already fallen quite strongly. There has been a fairly small reduction in the numbers working in the 'Building' and 'Public management, police, defense and education' sectors.

Table 1.1. Working population per economic sector, 1992

Economic sector	numbers working
Agriculture, fisheries and forestry	237,000
Food and beverage industry	166,000
Chemicals	139,000
Metals, electrical and transport requirements industries	524,000
Other industry	255,000
Energy	64,000
Construction	415,000
Commerce	823,000
Transport and communication	373,000
Other commercial services	961,000
Non-commercial services	923,000
Government, police, defense and education	848,000
Total (incl. economic sector not known)	5,844,000

Source: CBS/ROA

Table 1.2. Changes in the numbers working per economic sub-sector 1988-1992, and expected change 1993-1998 (average annual growth)

Economic sector	1988-1992 %	1993-1998 %
Agriculture, fisheries and forestry	-1.6	-0.5
Food and beverage industry	0.9	-0.5
Chemicals	1.0	1.4
Metals, electrical and transport requirements industries	1.4	-0.2
Other industry	1.0	-0.1
Energy	-1.5	0.2
Construction	-0.3	0.7
Commerce	1.8	1.0
Transport and communication	2.3	0.7
Other commercial services	3.7	1.2
Non-commercial services	2.0	1.9
Government, police, defense and education	-0.5	-0.4
Total (incl. economic sector not known)	1.6	0.7

Source: CBS/CPB/ROA

In general employment growth in the coming years is expected to be lower. The increase in the numbers working is expected to average 0.7% per year. The highest growth in employment is in 'Non-commercial services'. Given the increase in the number of older people, expenditures for

social and medical care would be expected to rise, so that employment in this sector is expected to increase strongly. 'Commerce' and 'Other commercial services' are also expected to enjoy stronger than average growth in employment levels. In contrast, in the sector 'Agriculture, fisheries and forestry' and in industry, except for the 'Chemicals' sector, falling employment is expected. It is also expected that the declining employment which had already developed in the period 1988-1992 in the 'Government, police, defense and education' sector will continue in the coming years. This decline results, on the one hand, from the extensive 'Efficiency Operation' in national government organs and, on the other hand, from military restructuring.

Developments in the labour market, by occupations

Table 1.3 gives a picture of the distribution of employment over ten occupational sectors. In the table two large occupational sectors, i.e., the 'Technical trades and industrial occupations' and the 'Commercial and administrative occupations' are conspicuous. These two occupational sectors employ almost 1.5 million and 2 million workers, respectively, and thus account for almost 60% of total employment.

Table 1.3. Numbers working per occupational sector, 1992

ROA code	occupational sector	numbers working
0	Educational occupations	308,000
1	Cultural occupations	78,000
2	Agricultural occupations	249,000
3	Technical and industrial occupations	1,496,000
4	Transport occupations	329,000
5	Medical and paramedical occupations	388,000
6	Commercial and administrative occupations	1,895,000
7	Socio-cultural occupations	187,000
8	Hotel catering, and service occupations	490,000
9	Public security and safety occupations	103,000
	Total (incl. occupation not known)	5,844,000

Source: CBS/ROA

Table 1.4 shows that the only occupational sector in which employment fell in the period 1988-1992 was 'Agricultural occupations'. This of course correlates with the large reduction in employment in the 'Agriculture, fisheries and forestry' sector in this period. The most rapid employment growth occurred in the 'Socio-cultural occupations' and the 'Medical and paramedical occupations'. The 'Commercial and administrative occupations' also grew strongly in 1988-1992. In contrast, employment growth has been especially sluggish in the occupational sectors of 'Educational occupations', 'Cultural occupations' and 'Technical trades and industrial occupations', along with the 'Agricultural occupations' already noted.

In the period 1993-1998, a strikingly strong growth in employment is expected for the 'Cultural occupations'. The numbers working in this occupational sector are expected to increase by as much as 1.8%, per year, on average. Above average growth is expected for the occupational sectors 'Medical and paramedical occupations' and 'Transport occupations', with 1.2% and 1% per year respectively. For the 'Educational' and 'Agricultural' occupations a slight fall in employment is expected, although it should be noted, as regards the later, that the expected decline in the numbers working is much less than the decline in employment which has occurred in the recent past.

Table 1.4. Changes in the numbers working per occupational sector, 1988-1992, and expected developments 1993-1998 (average annual growth)

ROA code	occupational sector	1988-1992 %	1993-1998 %
0	Educational occupations	0.6	-0.2
1	Cultural occupations	0.5	1.8
2	Agricultural occupations	-2.0	-0.2
3	Technical and industrial occupations	0.4	0.3
4	Transport occupations	0.9	1.0
5	Medical and paramedical occupations	2.3	1.2
6	Commercial and administrative occupations	1.9	0.7
7	Socio-cultural occupations	2.7	0.8
8	Hotel, catering, and service occupations	1.6	0.6
9	Public security and safety occupations	0.8	0.6
	Total (incl. occupation not known)	1.6	0.7

Source: CBS/ROA

Developments in the labour market, by categories of education

Table 1.5 provides an overview of the workforce, differentiated by categories of education. It can be seen that untrained workers account for almost 10% of employment. Almost a quarter of the workforce have completed education at the level of Lower General Secondary Education or Preparatory Vocational Education. Some 40% have completed education at an intermediate level (Intermediate Vocational Education, Senior General Secondary Education, or University Preparatory Education), while some 20% of employment goes to those with higher education, i.e., Higher Vocational Education and University Education.

Table 1.6 sketches a picture of employment development in recent years and for the near future for the 11 educational categories which have been distinguished. The table shows that there has, in past years, been an continuing shift towards Intermediate Vocational Education in skilled labour (see De Grip and Dekker, 1993). For the three main subject options within Intermediate Vocational Education, employment increased in the period 1990-1992 by averages ranging from 1.9% to 3.0% per year. The high growth in employment for people with Intermediate General Education (Senior General Secondary Education and University Preparatory

Education) is also striking. The number of people with such an educational background as their highest completed education has grown in recent years by more than 8% per year. Especially for women with this education, there has been a very large growth in employment levels.

The highest growth in employment has been in higher commercial education: the number of workers with education in this category has grown by as much as 8.7% annually. The number of workers with educational backgrounds in higher 'Arts and community services'[2] has also grown strongly in the past two years. It is striking that employment for those with higher technical or agricultural education has been very much lagging.

Table 1.5. Numbers working per educational category, 1992

Educational category	numbers working
Primary Education	563,000
Lower General Secondary Education / Preparatory Vocational Education level	
- general/commerce	531,000
- technical/agricultural	632,000
- community care	213,000
Intermediate level	
- general	301,000
- technical/agricultural	869,000
- commerce	715,000
- community care	594,000
Higher level	
- technical/agricultural	292,000
- commerce	327,000
- Arts and community services	717,000
Total (incl. other educational categories and education not known)	5,844,000

Source: CBS/ROA

For categories of education at the level of Primary Education and Junior General Secondary Education or Preparatory Vocational Education, employment has fallen or - for education at Junior General Secondary Education or Preparatory Vocational Education level in the general or commercial fields - has stagnated. For those without educational qualifications, employment has fallen by an average of more than 4% per year. The fall in employment for technical/agricultural education at Preparatory Vocational Education level has also been strikingly high, at 1% per

2. Education in 'Community care' and 'Arts and community services', within the categorization of training used in this chapter, refers to a much broader range of education than the name suggests. This category in fact includes Fine Arts, teacher training, and police and defense force training courses, and, at the higher level, social sciences and languages.

year. Preparatory Vocational Education in community care has suffered a slight reduction in employment, averaging 0.2% per year.

In the coming years employment developments are again expected to exhibit a clear dichotomy. While employment for those with intermediate and especially higher education will increase further, a fall in employment is expected for those with no qualifications, Junior General Secondary Education or Preparatory Vocational Education. The highest growth in employment is expected for those with higher commercial and economic education. This is in accordance with the picture which has emerged in past years, although the rate of growth will be considerably lower. For higher technical/agricultural education, in contrast, an increase in employment growth is expected in the period 1993-1998, with employment for those with this category of education expected to increase by an average of 2.7% per year.

Table 1.6. Changes in the numbers of workers from the various educational categories 1990-1992, and expected changes 1993-1998 (average annual growth)

Educational category	1990-1992 %	1993-1998 %
Primary Education	-4.2	-2.2
Junior General Secondary Education / Preparatory Vocational Education level		
- general/commerce	0.0	-0.6
- technical/agricultural	-1.0	-0.5
- community care	-0.2	-0.1
Intermediate level		
- general	8.4	1.0
- technical/agricultural	2.2	1.1
- commerce	1.9	0.9
- community care	3.0	1.6
Higher level		
- technical/agricultural	1.0	2.7
- commerce	8.7	2.9
- Arts and community services	5.2	1.9
Total (incl. other educational categories and education not known)	1.6	0.7

Source: CBS/ROA

For the varieties of education which we have distinguished at intermediate level, a growth in employment of around 1% per year is expected. One category of education which stands out in a positive sense is intermediate community care, with an expected employment growth of 1.6%. It is also striking that the growth in employment for those with intermediate-level general education will fall considerably in the coming period. As already noted, employment for those with education at the level of Junior General Secondary Education or Preparatory Vocational Education, or with only Primary Education, is expected to fall. The largest fall in employment, at

more than 2% per year, is expected to occur for workers without educational qualifications. General and commercial studies at Junior General Secondary Education and Preparatory Vocational Education level will also, according to the forecast, suffer a fall in employment of 0.6% per year. Employment in the two other categories within Junior General Secondary Schools and Preparatory Vocational Education institutions will fall somewhat less strongly. This is remarkable, since in past years, when employment levels were stable, general and commercial studies suffered the least.

One of the most important indicators which enables us to characterize the current labour market situation is, naturally, the current unemployment rate. Table 1.7 provides an overview of unemployment, differentiated according to the 11 educational categories which have been distinguished in this chapter.[3] Average unemployment in 1992 was 6.5% of the working population. Recent reports have however indicated that unemployment has risen rapidly during 1993.[4]

Table 1.7. Unemployment ('Unemployed Workforce') per educational category 1992

Educational category	%
Primary Education	13.2
Junior General Secondary Education / Preparatory Vocational Education level	
- general/commerce	10.1
- technical/agricultural	4.3
- community care	10.6
Intermediate level	
- general	9.5
- technical/agricultural	2.8
- commerce	5.2
- community care	5.5
Higher level	
- technical/agricultural	3.6
- commerce	4.6
- Arts and community services	5.8
Total (incl. other educational categories and education not known)	6.5

Source: Central Employment Board (1993)

3. There are some small differences between the categories of training used in table 1.5 and 1.6 and those which are used in table 1.7.

4. Up-to-date data on the 'unemployed working population' is not yet available, but some indication can be gained from the fact that 'registered unemployment', which in 1992 was no more than 4.2%, increased to 5.6% (average for the period August-October 1993).

Unemployment is highest among the working population who have no educational qualifications, but it is also relatively high for those with general and commercial or community care education at Junior General Secondary Education or Preparatory Vocational Education level, whereas it is quite low for those with Preparatory Vocational Education in the technical and agricultural fields. For intermediate categories, it is striking that unemployment is relatively high for those with general education. It is also apparent at this level that unemployment is relatively low among those whose studies were in the technical and agricultural field. Those with higher education face a similar situation: at this level unemployment is highest for those with arts and community services education.

For those designing a preventative labour market policy, and especially for those who are now making their study choices, it is not so much the current, but rather the future situation in the labour market which is important. The situation in the labour market could in fact change considerably in the future as a result of changes in the structure of employment and/or changes in the volume or composition of the labour supply. Table 1.8 shows the future labour market prospects of the various educational categories. These prospects are the result of offsetting demand against supply. On the demand side this means the sum of the expected expansion demand as a result of the growth in employment plus the replacement demand due to retirement, work disability or temporary withdrawal from the labour market. On the supply side of the equation there are the expected flows of school-leavers onto the labour market,[5] plus the number of short-term unemployed in the base year of the forecast period.[6] It must be realized that the aggregation level in this chapter is very high, meaning that the variations within an educational category are not examined. This makes this categorization of education unsuitable for use in educational and vocational guidance or other policy areas relating to education and the labour market. Chapter 3 gives a more detailed picture of the labour market prospects for each type of education.

For two educational categories, at this highly aggregated level, the labour market prospects are expected to be bad. This relates first to those without educational qualifications, for whom unemployment is already high at the moment. This high unemployment rate will continue in the coming years. The second group facing bad prospects are those with a general education at intermediate level. For another two educational categories the future labour market prospects can be categorized as moderate - for Preparatory Vocational Education in technical and agricultural fields and for commercial education at the intermediate level. The former, as has already been said, is expected to face a slight fall in employment, while for the latter the rather high flow of new entrants to the labour market is also important.

The table also shows that only one educational category, i.e., higher education in technical and

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5. 'School-leavers' include graduates from Higher Vocational Education and University Education.

6. Section 2.1 contains a schematic overview of the forecasting model.

agricultural fields, is expected to have favourable labour market prospects.[7] For the other educational categories the future labour market prospects can be said to be reasonable. In addition to two educational categories at a higher level and two at the intermediate level, there are also two educational categories at Junior General Secondary Education or Preparatory Vocational Education level for which, despite falling employment, reasonable labour market prospects are expected. For these educational categories, the expected flows of new entrants are very low.

For those offering their labour on the market the more or less structural risk position of the educational categories is important, in addition to the current and expected labour market situation described above. One of the most important indicators in this connection is the degree to which there are opportunities for workers to switch to other occupations on the labour market. This could be called the flexibility potential of the various categories of education. Those with general education usually have many alternative opportunities on the labour market, while those whose education is in the community care sector are generally employable in only a limited number of jobs, so that the choice of education in such a category entails greater risks. Chapter 3 will further examine the various indicators which determine the market position of types of education.

Table 1.8. Expected labour market prospects per educational category, 1993-1998

Educational category	future labour market prospects
Primary Education	poor
Junior General Secondary Education / Preparatory Vocational Education level	
- general/commerce	reasonable
- technical/agricultural	moderate
- community care	reasonable
Intermediate level	
- general	poor
- technical/agricultural	reasonable
- commerce	moderate
- community care	reasonable
Higher level	
- technical/agricultural	good
- commerce	reasonable
- Arts and community services	reasonable

Source: ROA

7. In fact these good labour market prospects are entirely owing to technical education. For higher agricultural education the prospects in the labour market are unfavourable (see *Statistical Appendix,* table 24).

Comparison with previous ROA forecasts

To enable the forecasts for the period 1993-1998 presented in this report to be compared to some extent with earlier ROA forecasts for the period 1989-1994, this chapter will close by correlating the average demand and supply forecasts by educational categories. This will involve an examination of changes in the level of employment (expansion demand), the replacement demand and the flows of school-leavers onto the market.

Table 1.9 gives a comparative overview of the forecast results for 1989-1994 and 1993-1998. The employment growth expected for the period 1993-1998 is not only lower than the actual growth in employment in past years (see table 1.6), but also lower than the forecast for 1989-1994. The replacement demand, in contrast, is noticeably higher in the latest forecast than in the previous one. This relates in part to differences in the data sources available when compiling the forecasts, but also to the rising average age of the working population. The aging of the working population in fact leads to increasing movements of workers out of the labour market, due to retirement, including the early retirement scheme, and work disability. The somewhat lower forecast for the flow of school-leavers onto the market reflects the beginning of a process expected to continue in the coming years, by which the proportion of young people in the working population steadily diminishes.

Table 1.9. Comparison of ROA forecasts by education, 1989-1994 and 1993-1998 (average annual rate)

	1989-1994 %	1993-1998 %
Expansion demand	0.9	0.7
Replacement demand	1.9	2.8
Flow of school-leavers	3.5	3.4

Source: ROA

All in all it can be concluded that, at least for the near future, no clear improvement in the unemployment problems is yet in sight. The expected demand for new entrants is approximately equal to the flow of school-leavers onto the labour market. In fact this means that these forecasts of the future labour market situation are, in general, clearly more favourable than the previous forecasts. However this is not true for all educational categories. Technical and agricultural education at an intermediate level, and higher arts and community services education are expected to have more favourable labour market prospects, whereas for general and commercial, and community care, education at Lower General Secondary Education and Preparatory Vocational Education level, as well as for Intermediate Vocational Education in the commercial and community care fields, the labour market prospects are less favourable than was expected in the previous forecast, for the period 1989-1994.

2. FLOWS IN THE LABOUR MARKET

2.1. Introduction

In ROA's Information System on Education and the Labour Market, a 'flow-volume' approach has been selected for use in compiling the labour market forecasts. This approach entails making forecasts of the flows out of and onto the labour market over a given future period. This approach has the advantage that the various underlying changes in demand and supply, as these are expected to develop over the whole forecast period, are brought explicitly into the picture. These forecasts are compiled for a total of 93 occupational classes and 49 types of education, spread over the full width of the labour market.

Figure 2.1 provides a schematic overview of the forecasting model used in ROA's information system on education and the labour market.[8] The first component on the demand side of the labour market is the *expansion demand,* indicating changes in the level of employment in a particular occupational class or for a given type of education. There is also an element of *replacement demand* on the labour market, arising from retirement, early retirement schemes, work disability, temporary withdrawals from the labour market, occupational mobility, etc.. There is however an important difference between the replacement demand per occupational class and the replacement demand per type of education. Occupational mobility has an influence on the replacement demand for a given occupational class, but has no effect on the replacement demand per type of education, since switching occupations has no effect on the educational structure of employment. The expected expansion demand and replacement demand together comprise the forecast of the number of *job openings* for new entrants to the labour market. The expected supply of new entrants is then balanced against this total demand. This expected supply consists of the future *flow of school-leavers* who will enter the market in the forecast period plus the numbers of *short-term unemployed* who were already waiting at the edge of the market at the beginning of the period. Bringing the expected flows on the demand and supply sides together in one analysis produces an *indication of the future labour market prospects* for each type of education. The labour market forecasts presented in this report relate to the period 1993-1998.

This chapter surveys the various 'building blocks', which are put together to make up labour market forecasts for the various types of education and occupations. It will begin with the expected expansion demand over the period 1993-1998, for both occupational classes and types of education, followed by the expected replacement demand for the same two dimensions. In discussing both the expansion and replacement components of demand, we will mention only the occupational classes and types of education for which the highest or the lowest demand is expected, in relative terms or in absolute numbers. Finally, the forecasts of the flows of school-leavers onto the labour market will be presented, again mentioning only the types of education from which the flow is expected to be particularly high or low in relative terms or absolute numbers.

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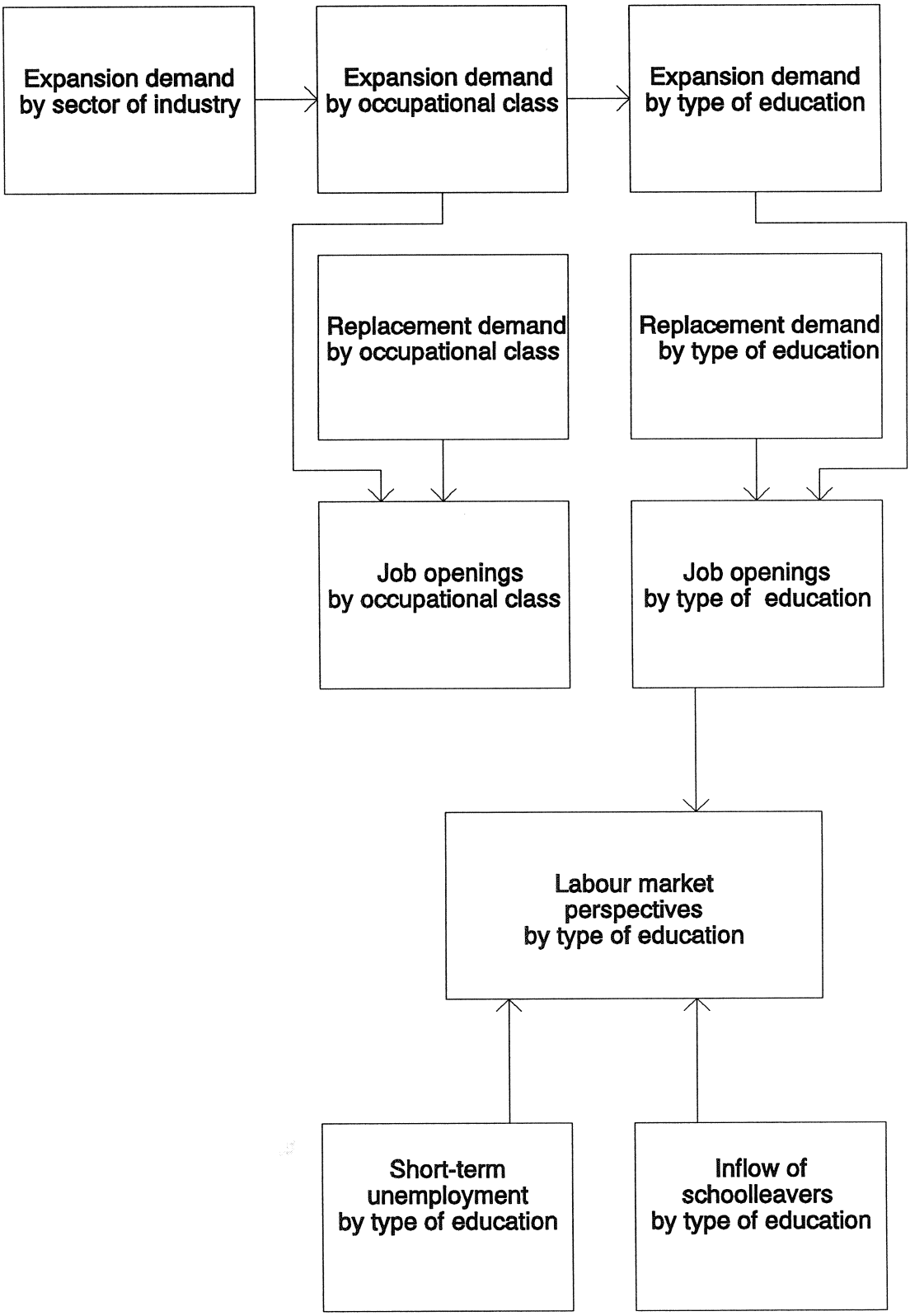
8. For a detailed description see Dekker, De Grip, Borghans, Matheeuwsen, Wieling and Willems (1993).

Figure 2.1. Forecasting model of the ROA Information System on Education and the Labour Market



2.2. Expansion demand

Occupations

Table 2.1 presents an overview of the ten occupational classes for which, in the period 1993-1998, the expansion demand is expected to be highest. The upper part of the table shows the occupational classes for which the growth in employment in terms of *absolute numbers* is expected to be highest, while the lower part shows the occupational classes with the highest *relative* expansion demand. The relative expansion demand is expressed as an average annual rate of growth, as a percentage of employment in the previous year.

Table 2.1. Occupational Classes with the highest expected expansion demand 1993-1998 (total numbers, and average annual rate)

ROA code	occupational class	number	%
Absolute			
3021	Directors, managers and supervisors in manufacturing	34,600	1.8
6131	System analysts, programmers and system supervisors	22,300	3.1
5021	Registered nurses and home nursing personnel	18,100	2.6
6211	Sales assistants	14,900	1.1
6031	Senior finance and sales managers	14,300	2.3
6124	Book-keepers, bank and tax department employees	12,500	0.7
5022	Student nurses and home nursing personnel	9,800	1.7
8212	Geriatric help, kindergarten staff and nannies	9,200	1.4
7021	Journalists, authors and announcers	8,100	3.7
4011	Freight handlers, packers, and packaging workers	7,300	1.1
Relative			
7021	Journalists, authors and announcers	8,100	3.7
5031	Physiotherapists and occupational therapists	7,100	3.1
6131	System analysts, programmers and system supervisors	22,300	3.1
5025	EEC technicians, speech therapists and other paramedical occupations	3,600	2.9
7035	Information service and media specialists	2,500	2.7
7032	Personnel officers, vocational advisors and employment agents	4,000	2.7
5021	Registered nurses and home nursing personnel	18,100	2.6
1321	Photographers, film-makers, designers, and window-dressers	4,600	2.5
1331	Visual and performing artists	3,900	2.3
6031	Senior finance and sales managers	14,300	2.3
5033	Physicians, medical specialists, pharmacists	4,800	2.3

Source: ROA

Positive growth in employment is expected for about two thirds of all occupational classes. The average expected growth in employment is 0.7% per year. In terms of absolute numbers, expansion demand will be greatest for the rather heterogeneous occupational class of 'Directors, managers and supervisors in manufacturing'. The growth which this occupational

class enjoyed in the second half of the 80s and the early 90s is thus expected to continue, although the rate of growth is expected to be lower in the future. Employment in this occupational class is expected to increase over this five year period by almost 35,000. A considerable increase in employment is also anticipated for the occupational classes of 'System analysts, programmers, and system supervisors' and 'Registered nurses, district nurses and midwives'.

Table 2.2. Occupational classes with the lowest expected expansion demand 1993-1998 (total numbers and average annual rate)

ROA code	occupational class	number	%
Absolute			
6221	Shopkeepers, retail and wholesale staff	-8,200	-1.1
0131	Primary and special education teachers	-4,700	-1.0
3811	Building materials, glass, and ceramic production workers	-4,100	-2.4
3213	Clothing, textile and fur product makers	-2,400	-2.7
3111	Food and beverage processors	-2,000	-0.9
3212	Upholsterers, shoemakers and leatherworkers	-1,700	-2.0
2011	Agricultural workers	-1,600	-0.2
3312	Carpenters and woodworkers	-1,500	-0.2
6222	Commercial representatives, sales managers and brokers	-1,500	-0.2
3711	Electrical product assembly workers and quality controllers	-1,500	-1.4
3613	Welders and engineering workers	-1,500	-0.5
2012	Farmers	-1,500	-0.2
Relative			
3211	Textile production workers	-1,400	-3.8
3213	Clothing, textile and fur product makers	-2,400	-2.7
3722	Intermediate electrical engineers	-500	-2.6
3811	Building materials, glass, and ceramic production workers	-4,100	-2.4
3212	Upholsterers, shoemakers and leatherworkers	-1,700	-2.0
3711	Electrical product assembly workers and quality controllers	-1,500	-1.4
6112	Data typists and computer operators	-800	-1.2
6221	Shopkeepers, retail and wholesale staff	-8,200	-1.1
3022	Technical and medical representatives	-300	-1.0
0131	Primary and special education teachers	-4,700	-1.0

Source: ROA

The occupational class of 'Journalists, authors and announcers' is expected to have the highest relative expansion demand, with an average of almost 4% per year. It is also striking that the relative expansion demand for a number of socio-cultural occupations, and medical and paramedical occupations,[9] is expected to be high. For example, the expansion demand for 'Physiotherapists and occupational therapists', is relatively high, with an expected annual growth in employment of more than 3%. A similar annual growth rate is expected for the

9. That is, the occupational classes with ROA codes beginning with 7 and 5, respectively.

'System analysts, programmers, and system supervisors', which means that this occupational class will continue to be one of the biggest 'occupational winners'. The very vigorous growth which this occupational class achieved in the 80s will not however be repeated in the coming years. It is also striking that relatively high expansion demand is expected for two cultural occupations, i.e. 'Photographers, film makers, designers and window-dressers' and 'Visual and performing artists'.

Table 2.2 shows the occupational classes for which employment is expected to fall most sharply. In absolute terms the fall in employment will be greatest for the occupational class 'Shopkeepers, retail and wholesale staff', for which, in the period 1993-1998, employment is expected to fall by more than 8,000. This amounts to an average decline of something over 1% per year.

The fall in employment will be greatest in percentage terms for the 'Textile production workers', with an average decline of almost 4% per year. It is striking that the occupational classes with a relatively low expansion demand relate mainly to technical and industrial occupations and tradesmen.[10] Moreover, for most of these occupational classes, the education level of the workers is relatively low.

Types of education

Table 2.3 shows the ten types of education for which the expected expansion demand, in both absolute and relative terms, is the highest. It is immediately obvious that the types of education at intermediate and higher level are growing especially strongly. In absolute terms a number of Intermediate Vocational Education courses emerge as the types of education with the strongest growth. The largest growth in employment among these is for 'Intermediate Vocational Education (IVE), Engineering', but a rather high increase in employment is also expected for the 'Commerce and Administration', 'Community care' and 'Nursing and Paramedical Services' varieties of Intermediate Vocational Education. Higher Vocational Education (HVE) in 'Commerce and Administration' is also expected to enjoy a large employment increase.

The list of types of education with the highest relative expansion demand in the period 1993-1998 consists almost entirely of types of education within Higher Vocational and University (UE) Education. The only exception is the Preparatory Vocational Education (PVE) course in 'Security', but this is a very small-scale training option not offered in normal full-time day courses. In proportional terms, the largest increase in employment is expected for University Education in 'Economics, Econometrics, and Business Administration' and 'Engineering'. It is also striking that for University Education in 'Fine Arts', the expected expansion demand is relatively high, although it must be noted in this respect that the absolute growth in employment for this type of education, of just 400 jobs, will be rather limited.

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10. These are the occupational classes with a code beginning with a 3.

Table 2.3. Types of education with the highest expected expansion demand 1993-1998 (total numbers and average annual rate)

Type of education	number	%
Absolute		
IVE Engineering	37,300	1.0
IVE Commerce and Administration	31,900	0.9
HVE Commerce and Administration	24,500	2.6
IVE Community Care	17,300	1.6
IVE Nursing and Paramedical Services	16,600	1.8
HVE Engineering	15,300	2.5
Senior General Secondary Education	15,200	1.0
HVE Nursing and Paramedical Services	12,200	3.0
HVE Social and Cultural	11,700	2.2
UE Social Sciences	10,900	3.0
Relative		
UE Economics, Econometrics and Business Administration	10,400	4.0
UE Engineering	10,100	3.6
PVE Security	900	3.5
UE Fine Arts	400	3.4
UE Social Sciences	10,900	3.0
HVE Fine Arts	5,400	3.0
HVE Nursing and Paramedical Services	12,200	3.0
UE Law and Public Administration	8,400	2.9
UE Agriculture	1,200	2.9
HVE Business Administration Technology	1,100	2.8

PVE = Preparatory Vocational Education
HVE = Higher Vocational Education
IVE = Intermediate Vocational Education
UE = University Education

Source: ROA

Table 2.4 indicates the types of education with the lowest expansion demand. It can be seen that a fall in employment is expected for 7 of the 49 types of education which we have distinguished. These are all at the lower level. It is not surprising that the expected fall in employment is largest for the 'untrained' workers (i.e., 'Primary Education'). According to the forecasts, in the coming five years more than 60,000 jobs for unqualified workers will be lost, which amounts to an average fall in employment of more than 2% per year.

'Lower General Secondary Education' and 'Preparatory Vocational Education, Technical' will also suffer a large fall in employment, in absolute numbers. These types of education are forecast to lose more than 10,000 jobs in the coming five years, which amounts to an average decrease in employment of about 0.5% per year. For the 'Commercial and Administrative' and 'Agricultural' options in Preparatory Vocational Education the relative fall in employment is expected to be of similar proportions.

Table 2.4. Types of education with the lowest expected expansion demand 1993-1998 (total numbers and average annual rate)

Type of education	number	%
Absolute		
Primary education	-61,700	-2.2
Junior General Secondary Education	-13,400	-0.6
PVE Technical	-12,700	-0.5
PVE Commerce and Administration	-3,500	-0.6
PVE Agriculture	-2,700	-0.6
PVE Community Care	-1,800	-0.2
PVE Transport and Harbour	-300	-0.1
UE Fine arts	400	3.4
HVE Interpreter and Translator	500	1.6
UE Medical Laboratory	600	2.3
Relative		
Primary education	-61,700	-2.2
PVE Commerce and Administration	-3,500	-0.6
Junior General Secondary Education	-13,400	-0.6
PVE Agriculture	-2,700	-0.6
PVE Technical	-12,700	-0.5
PVE Community Care, Hotel and Catering	-1,800	-0.2
PVE Transport and Harbour	-300	-0.1
IVE Administrative, Legal and Fiscal	1,000	0.4
HVE Teacher Training	8,600	0.7
IVE Hotel, Catering and Hairdressers	1,700	0.8

PVE = Preparatory Vocational Education
HVE = Higher Vocational Education
IVE = Intermediate Vocational Education
UE = University Education

Source: ROA

2.3. Replacement demand

Occupations

As has already been noted in section 2.1, when determining the future number of job openings for new entrants to the labour market, it is necessary to consider not only the expansion demand but also the replacement demand as a result of labour turnover through retirement, the early retirement schemes, work disability, occupational mobility between occupational classes, etc.. Table 2.5 shows the occupational classes which, according to the forecasts, will have the highest replacement demand in the years 1993-1998. Once more a distinction has been made between the occupations with the highest demand in absolute and in relative terms.

The average expected replacement demand per occupational class for the period 1993-1998 is around 3.3% per year. The highest absolute replacement demand will be for the occupational

class of 'Sales assistants', in which many young people work. It is expected that, over the whole forecast period, replacements will be needed for some 66,000 departing workers. This is linked chiefly to the relatively large number of women in this occupational class who quit the labour market prematurely. For the occupational class of 'Directors, managers and supervisors in manufacturing', the future replacement demand will also be high in absolute terms. Some 65,000 new entrants will be needed to meet the replacement demand for this occupational class. For the commercial and administrative classes of 'Purchasing and sales clerks' and 'Book-keepers, bank, and tax department employees' the replacement requirement over the whole forecast period is also estimated to be more than 60,000.

Table 2.5. Occupational classes with the highest expected replacement demand 1993-1998 (total numbers and average annual rate)

ROA code	Occupational class	number	%
Absolute			
6211	Sales assistants	66,600	4.7
3021	Directors, managers and supervisors in manufacturing	65,700	3.3
6125	Purchasing and sales clerks	63,100	3.6
6124	Book-keepers, bank and tax department employees	61,000	3.3
6122	Secretaries and typists	32,800	4.1
8211	Porters, cleaners and domestics	29,500	3.7
6221	Shopkeepers, retail and wholesale staff	28,400	3.4
2011	Agricultural workers	26,000	3.5
8212	Geriatric help, kindergarten staff and nannies	25,700	3.8
4211	Drivers and conductors	25,500	2.8
Relative			
3213	Clothing, textile and fur product makers	6,100	5.8
5024	Pharmacy assistants, opticians and orthopaedists	3,600	5.1
1131	Translators and other literary professions	1,300	4.8
6211	Sales assistants	66,600	4.7
6126	Telephonists, receptionists and pollsters	21,800	4.6
3631	Higher mechanical engineers	3,600	4.6
5023	Doctor's, dentist's, and veterinary assistants	5,600	4.5
8221	Hairdressers and beauticians	8,100	4.3
6112	Data typists and computer operators	3,300	4.3
1231	Pastoral vocations	1,600	4.3

Source: ROA

The list of occupational classes with a high replacement demand in relative terms consists mainly of occupations in which relatively many women work. These are mainly vocations providing support services in the fields of health care and commerce and administration. Many of these women withdraw, either permanently or temporarily, from the labour market while they are relatively young, in connection with the birth and care of their children. The expected replacement demand for 'Higher mechanical engineers' and 'Pastoral occupations' is also

relatively high. For the latter class this is strongly linked to the high average age of those working in the field, which means that the proportion of the workers retiring will be relatively high (see also chapter 3).

Table 2.6 provides an overview of the occupational classes for which the future replacement demand is expected to be low. The occupational classes with a low replacement demand in absolute terms are, naturally, mainly the smaller classes. The lowest replacement demand in relative terms is expected for the 'System analysts, programmers, and system supervisors'. This is not surprising, considering that this occupational class has grown very rapidly in the last decade, and that this growth comes chiefly by recruiting young people. A similar picture emerges for the 'Journalists, authors and announcers', for which the recent increase in employment again means that the replacement demand in the immediate future will be relatively limited.

Table 2.6. Occupational classes with the lowest expected replacement demand 1993-1998 (total numbers and average annual rate)

ROA code	Occupational class	number	%
Absolute			
3022	Technical and medical representatives	500	1.8
4112	Sailors, deckhands and engine-room workers	600	2.3
3722	Intermediate electrical engineers	700	3.3
4121	Ship's officers and marine inspectors	1,100	2.8
3211	Textile production workers	1,200	3.0
1131	Translators and other literary professions	1,300	4.8
5035	Dentists and dental specialists	1,400	4.0
1231	Pastoral vocations	1,600	4.3
0221	Trainers, sports officials and sports professionals	1,800	3.9
3622	Intermediate mechanical engineers and marine engineers	1,900	3.1
Relative			
6131	System analysts, programmers and system supervisors	9,000	1.3
7021	Journalists, authors and announcers	3,300	1.6
3022	Technical and medical representatives	500	1.8
9121	Police, fire and security officers	6,000	1.9
3911	Bricklayers, tilers, paving workers, and plasterers	4,600	1.9
6332	Legal professionals	3,400	2.0
7033	Community workers and probation officers	6,800	2.0
6121	Administrative supervisors	5,500	2.2
3621	Automobile and (motor) cycle mechanics	5,200	2.2
6132	Accountants and economists	6,300	2.2

Source: ROA

The occupational classes with a relatively limited replacement demand also include a number of more or less traditional occupational classes, such as 'Legal professionals', 'Bricklayers, tilers, paving workers, and plasterers 'and 'Automobile and (motor) cycle mechanics'. Employment for

legal professionals has grown sharply, especially in the 70s and early 80s (see De Grip, 1986 and 1987), as a result of which relatively few workers will reach pensionable age in the coming years. For the other two occupational classes, in contrast, the cause is a fall in employment levels, meaning that departing workers are not replaced by new entrants. These three occupational classes are typical examples of professional sub-markets, for which mobility to other occupational classes is fairly small. This also leads to a relatively low replacement demand.

Types of education

The replacement demand for each education type is expected to average about 2.8% per year. As already noted, this is lower than the average replacement demand for occupational classes, because mobility on the labour market has no effect in this case. Table 2.7 shows the ten types of education which, in absolute and in relative terms, the highest replacement demand is expected.

Table 2.7. Types of education with the highest expected replacement demand, 1993-1998 (total numbers and average annual rate)

Type of education	number	%
Absolute		
IVE Commerce and Administration	115,100	3.1
Junior General Secondary Education	94,100	4.1
IVE Engineering	88,500	2.4
PVE Technical	74,300	2.7
Primary Education	60,900	2.0
PVE Community Care, Hotel and Catering	58,300	4.9
Senior General Secondary Education	51,200	3.3
IVE Community Care	36,900	3.2
HVE Teacher training	35,700	2.8
IVE Nursing and Paramedical Services	27,100	2.8
Relative		
PVE Community Care, Hotel and Catering	58,300	4.9
Junior General Secondary Education	94,100	4.1
HVE Transport and Harbour	5,900	4.0
IVE Transport and Harbour	10,100	3.9
HVE Interpreter and Translator	1,300	3.8
PVE Agriculture	18,200	3.5
UE Theology	1,200	3.5
IVE Medical Laboratory	3,900	3.4
Senior General Secondary Education	51,200	3.3
IVE Community Care	36,900	3.2
IVE Social and Cultural	6,800	3.2

PVE = Preparatory Vocational Education
HVE = Intermediate Vocational Education
IVE = Intermediate Vocational Education
UE = University Education

Source: ROA

Naturally the types of education with a large absolute replacement demand are mainly the most sizable categories of education. However, for a number of these types of education the expected replacement demand is also large in relative terms. The highest relative replacement demand for the period 1993-1998 is expected for Preparatory Vocational Education in 'Community Care, Hotel and Catering'. Every year an average of about 5% of the workers with this educational background withdraw from the labour market and must be replaced by new entrants.

Table 2.8. Types of education with the lowest expected replacement demand, 1993-1998 (total numbers and average annual rate)

Type of education	number	%
Absolute		
HVE Business Administration Technology	200	0.5
UE Fine Arts	300	2.5
UE Pharmacy	700	2.8
PVE Security	700	2.8
HVE Police, Fire and Defense Forces	800	1.6
UE Agriculture	1,000	2.3
UE Theology	1,200	3.5
HVE Interpreter and Translator	1,300	3.8
IVE Non-medical Laboratory	1,800	2.9
HVE Agriculture	2,100	2.4
Relative		
HVE Business Administration Technology	200	0.5
PVE Transport and Harbour	2,800	1.3
UE Law and Public Administration	4,500	1.6
HVE Police, Fire and Defense Forces	800	1.6
HVE Commerce and Administration	13,500	1.5
HBO Nursing and Paramedical Services	6,400	1.6
HVE Non-medical Laboratory	2,700	1.8
HVE Social and Cultural	9,900	1.9
IVE Administrative, Legal and Fiscal	4,800	1.9
Primary Education	60,900	2.0

Source: ROA

The table also shows that those types of education in which most of the students are women are prominent in the list of types of education with a relatively high future replacement demand. In addition to Preparatory Vocational Education in 'Community Care, Hotel and Catering', a high replacement demand is also expected for 'Medical Laboratory' 'Hotel, Catering and Hairdressers' and 'Social and Cultural' varieties of Intermediate Vocational Education, all "women's courses". Moreover it is striking that the types of education 'Higher Vocational Education, Transport and Harbour' and 'Intermediate Vocational Education, Transport and Harbour' are expected to face a high replacement demand. This would appear to be due to the relatively large numbers of workers departing from the workforce because of disability,

retirement, and the early retirement schemes. Finally, the types of education 'Preparatory Vocational Education, Agriculture' and 'University Education, Theology' are expected to enjoy a relatively high replacement demand. This is related to the comparatively high average age of those in the workforce who have this educational background.

Table 2.8 shows that the lowest replacement demand in absolute and relative terms is expected for the relatively new Higher Vocational Education course in 'Business Administration Technology', for which the average replacement demand in the period 1993-1998 will be just 0.5% per year. In fact the table shows that relatively low replacement demand is expected for many types of Higher Vocational Education. This relates to the greatly increased interest in Higher Vocational Education in the recent past, which means that the majority of the workers are still very young.

It is also striking that 'Preparatory Vocational Education, Transport and Harbour' has a very low expected replacement demand, especially considering that we have just seen that education in this field at Intermediate and Higher Vocational Education level is expected to enjoy a relatively high replacement demand. This difference can however be explained by the expected fall in employment for those with this type of education at the level of Preparatory Vocational Education, which means that some departing workers will not be replaced by new entrants.

2.4. Job openings

Occupations

The total demand for new entrants to the labour market, or the number of job openings for them, consists of the sum of the growth in employment and the replacement demand. On average just 17% of the job openings for each occupational class are due to expected increases in employment, while the remaining 83% will result from future replacement demand. The replacement demand is the largest source of job openings for 85 of the 93 occupational classes which we have distinguished.

Table 2.9 provides an overview of the ten occupational classes with the highest numbers of job openings. The list of occupational classes with high relative numbers of job openings consists almost entirely of occupations for which either a large expansion demand or a large replacement demand is expected. The only exception are the 'Dentists and dental specialists', for which neither the expansion demand nor the replacement demand, separately considered, are very high. Otherwise, for all the occupations in the lower part of table 2.9, the replacement demand provides the larger portion of the total number of job openings.

The highest relative number of job openings is expected for the 'Physiotherapists and occupational therapists', for which the annual demand for new entrants will be almost 7% of the number working at present. In table 2.1 it has already been shown that this occupational class has a relatively high expansion demand. This is also true for the occupational classes 'EEC

technicians, speech therapists and other paramedical occupations', 'Visual and performing artists' and 'Registered nurses, district nurses and midwives'. For the 'Clothing, textile, and fur product makers' a fall in employment is expected, so that the job openings consist only of replacement demand.

Table 2.9. Occupational classes expected to have the highest numbers of job openings, 1993-1998 (total numbers and average annual rate)

ROA code	occupational class	number	%
Absolute			
3021	Directors, managers and supervisors in manufacturing	100,200	4.9
6211	Sales assistants	81,500	5.6
6124	Book-keepers, bank and tax department employees	73,500	3.9
6125	Purchasing and sales clerks	64,800	3.6
5021	Registered nurses, district nurses and midwives	40,300	5.6
6122	Secretaries and typists	37,700	4.6
8212	Geriatric help, kindergarten staff and nannies	34,900	5.1
5022	Student nurses and home nursing personnel	34,700	5.4
6131	System analysts, programmers and system supervisors	31,300	4.2
8111	Cooks, waiters and kitchen workers	31,200	4.3
Relative			
5031	Physiotherapists and occupational therapists	16,500	6.8
5025	EEC technicians, speech therapists and other paramedical occupations	8,300	6.2
5035	Dentists and dental specialists	2,100	5.9
3213	Clothing, textile and fur product makers	6,100	5.8
1331	Visual and performing artists	10,600	5.8
5024	Pharmacy assistants, opticians and orthopaedists	4,000	5.7
5023	Doctor's, dentist's, and veterinary assistants	7,300	5.7
6211	Sales assistants	81,500	5.6
5021	Registered nurses, district nurses and midwives	40,300	5.6
1231	Pastoral vocations	2,100	5.5

Source: ROA

Table 2.10 gives an overview of the occupational classes with the lowest absolute or relative numbers of expected job openings. It can be seen that the occupational classes for which comparatively limited numbers of job openings are expected are mainly those with a relatively low replacement demand. Of the total of 15 occupational classes with relatively low numbers of job openings, six appeared in the list of the ten occupational classes with relatively low replacement demand.

The lowest relative number of job openings is expected for the occupational class 'Technical and medical representatives'. These job openings are entirely due to replacement demand, averaging 1.8% of the employment pool per year. The occupational class 'Sailors, deckhands and engine-room workers' is also expected to face a fall in employment and the total demand

for new entrants consequently consists entirely of replacement demand. For the 'Bricklayers, tilers, paving workers, and plasterers', the low number of future job openings results from a small increase in employment, combined with very low replacement demand.

Table 2.10. Occupational classes expected to have the lowest numbers of job openings, 1993-1998 (total numbers and average annual rate)

ROA code	occupational class	number	%
Absolute			
3022	Technical and medical representatives	500	1.8
4112	Sailors, deckhands and engine-room workers	600	2.3
3722	Intermediate electrical engineers	700	3.3
4121	Ship's officers and marine inspectors	1,100	2.8
3211	Textile production workers	1,200	3.0
1131	Translators and other literary professions	1,400	4.9
3622	Intermediate mechanical engineers and marine engineers	1,900	3.1
5035	Dentists and dental specialists	2,100	5.9
1231	Pastoral vocations	2,100	5.5
3311	Wood, paper and cardboard product workers	2,200	3.0
Relative			
3022	Technical and medical representatives	500	1.8
3911	Bricklayers, tilers, paving workers, and plasterers	5,200	2.1
4112	Sailors, deckhands and engine-room workers	600	2.3
9121	Police, fire and security officers	7,500	2.4
3621	Automobile and (motor) cycle mechanics	5,700	2.4
7033	Community workers and probation officers	9,600	2.8
4121	Ship's officers and marine inspectors	1,100	2.8
4211	Drivers and conductors	26,800	2.9
2012	Farmers	22,500	2.9
3211	Textile production workers	1,200	3.0
3311	Wood, paper and cardboard product workers	2,200	3.0
6132	Accountants and economists	9,000	3.0
6222	Commercial representatives, sales managers and brokers	21,600	3.0
3613	Welders and engineering workers	9,000	3.0
3914	Plumbers	7,000	3.0

Source: ROA

Types of education

The total demand for new entrants has also been determined for each type of education. For the forecast period 1993-1998, 20% of the job openings, measured by type of education, are expected to derive from expansion demand, while 80% will result from replacement demand. Tables 2.11 and 2.12 give an overview of the types of education with the highest and lowest numbers of job openings, respectively .

In table 2.11 it is striking that relatively high numbers of job openings are expected for the various varieties of Higher Vocational Education and University Education in particular. The only exception is Preparatory Vocational Education in 'Security', for which the relatively large number of expected job openings is linked mainly to the strong expected growth in employment. There are a number of other types of education for which the high relative number of job openings is explained largely by an expected increase in employment. Thus the two types of education for which the highest relative growth in employment is expected, i.e., University Education in 'Economics, Econometrics and Business Administration' and in 'Engineering', are found again in this table of types of education with the largest numbers of job openings in relative terms. The table also includes two types of education for which the expected replacement demand is relatively high (see table 2.7): 'University Education, Theology' and 'Higher Vocational Education, Interpreter and Translator'.

Table 2.11. Types of education expected to have the highest numbers of job openings, 1993-1998 (total numbers and average annual rate)

Type of education	number	%
Absolute		
IVE Commerce and Administration	147,000	3.9
IVE Engineering	125,900	3.4
Junior General Secondary Education	94,100	4.1
PVE Technical	74,300	2.7
Senior General Secondary Education	66,500	4.2
Primary Education	60,900	2.0
PVE Community Care, Hotel and Catering	58,300	4.9
IVE Community Care	54,200	4.6
HVE Teacher training	44,300	3.4
IVE Nursing and Paramedical Services	43,800	4.4
Relative		
HVE Transport and Harbour	9,600	6.2
UE Engineering	18,200	6.1
PVE Security	1,600	5.9
UE Economics, Econometrics and Business Administration	15,900	5.9
UE Theology	2,100	5.8
UE Fine Arts	700	5.6
HVE Engineering	34,500	5.3
UE Mathematics and Natural Sciences	11,000	5.2
HVE Interpreter and Translator	1,900	5.2
HVE Fine Arts	9,800	5.2

PVE = Preparatory Vocational Education
IVE = Intermediate Vocational Education
HVE = Higher Vocational Education
UE = University Education

Source: ROA

For five of the ten types of education with a relatively high number of expected job openings,

replacement requirements make up the largest part of the total demand. In contrast, the expansion demand is the most important component for University Education in 'Engineering' and 'Economics, Econometrics, and Business Administration', for Higher Vocational Education in 'Fine Arts', and for Preparatory Vocational Education in 'Security'. For University Education in 'Mathematics and Natural Sciences', the expansion demand and the replacement demand are expected to be very similar.

Table 2.12. Types of education expected to have the lowest numbers of job openings, 1993-1998 (total numbers and average annual rate)

Type of education	number	%
Absolute		
UE Fine Arts	700	5.6
HVE Business Administration Technology	1,200	3.2
UE Pharmacy	1,300	4.9
HVE Police, Fire and Defense Forces	1,500	3.1
PVE Security	1,600	5.9
HVE Interpreter and Translator	1,900	5.2
UE Theology	2,100	5.8
UE Agriculture	2,200	4.9
IVE Non-medical Laboratory	2,600	3.9
PVE Transport and Harbour	2,800	1.3
Relative		
PVE Transport and Harbour	2,800	1.3
Primary Education	60,900	2.0
IVE Administrative, Legal and Fiscal	5,800	2.2
PVE Technical	74,300	2.7
PVE Commerce and Administration	19,300	2.9
HVE Police, Fire and Defense Forces	1,500	3.1
HVE Business Administration Technology	1,200	3.2
UE Teacher training	2,800	3.3
IVE Engineering	125,900	3.4
HVE Teacher training	44,300	3.4

PVE = Preparatory Vocational Education
HVE = Higher Vocational Education
IVE = Intermediate Vocational Education
UE = University Education

Source: ROA

The lower part of table 2.12 lists the types of education which are expected, in the coming five years, to have the lowest relative numbers of job openings. The table shows that these are mainly some varieties of Preparatory Vocational Education, and workers without any education. However it is striking that a number of types of Higher Vocational Education are also in the list of types of education with a relatively low number of job openings. Nevertheless there is an important difference between the two groups: for the types of education at a lower level, this low number of job openings is directly linked to stable or declining levels of employment, which

also leads to lower replacement demand. For the options within Higher Vocational Education which appear here, the low number of job openings is caused only by their relatively low replacement demand. This is, however, as noted above, the direct result of the recent rise in employment for those coming from Higher Vocational Education, which has meant that the present workers are relatively young and will therefore require almost no replacements in coming years. For nine of the ten types of education which appear in this part of the table, the replacement demand is the most important component of the total demand for new entrants. The exception is 'Higher Vocational Education, Business Administration Technology', for which the expansion demand is the most important component.

2.5. Flows of school-leavers onto the labour market

Thus far in this chapter the focus has been only on future changes on the demand side of the labour market. The development of expansion and replacement demand must in fact be matched with simultaneous developments on the supply side. Tables 2.13 and 2.14 provide an outline of the types of education which are characterized by high and low flows of school-leavers onto the labour market, respectively.

Table 2.13. Types of education expected to have the highest flows of school-leavers onto the labour market, 1993-1998 (total numbers and average annual rate)

Type of education	number	%
Absolute		
IVE Commerce and Administration	149,900	4.2
IVE Engineering	139,200	3.7
Senior General Secondary Education	115,300	6.7
Primary Education	66,100	2.2
PVE Technical	59,200	2.3
IVE Nursing and Paramedical Services	44,100	4.6
Junior General Secondary Education	42,700	2.0
IVE Community Care	35,800	3.2
HVE Commerce and Administration	35,700	3.6
HVE Teacher training	33,500	2.5
Relative		
UE Fine Arts	3,300	10.6
UE Agriculture	4,500	8.5
IVE Social and Cultural	20,200	7.3
PVE Security	3,300	7.1
Senior General Secondary Education	115,300	6.7
UE Arts	15,000	6.6
UE Social Sciences	27,500	6.3
UE Engineering	18,100	6.0
HVE Agriculture	5,600	5.9
UE Economics, Econometrics and Business Administration	17,800	5.8

PVE = Preparatory Vocational Education
IVE = Intermediate Vocational Education
HVE = Higher Vocational Education
UE = University Education

Source: ROA

The list of types of education from which large numbers of school-leavers, in absolute terms, are expected to flow onto the labour market consists mainly of the larger types of education. Intermediate Vocational Education in 'Commerce and Administration' and 'Engineering' and 'Lower General Secondary Education' in particular, produce large flows, in absolute numbers, of school-leavers entering the labour market. The school-leavers having only 'Primary Education' are mainly drop-outs from Secondary Education.

Table 2.14. Types of eduction expected to have the lowest flows of school-leavers onto the labour market, 1993-1998 (total numbers and average annual rate)

Type of education	number	%
Absolute		
UE Theology	900	2.3
HVE Interpreter and Translator	1,000	3.7
PVE Transport and Harbour	1,200	0.6
UE Pharmacy	1,300	4.7
IVE Non-medical Laboratory	1,400	2.5
IVE Medical Laboratory	1,600	1.3
HVE Transport and Harbour	2,000	1.6
HVE Police, Fire and Defense Forces	2,200	4.0
HVE Medical Laboratory	2,500	2.7
IVE Administrative, Legal and Fiscal	2,800	1.1
Relative		
PVE Transport and Harbour	1,200	0.6
IVE Administrative, Legal and Fiscal	2,800	1.1
PVE Agriculture	5,800	1.2
IVE Medical Laboratory	1,600	1.3
HVE Transport and Harbour	2,000	1.6
Junior General Secondary Education	42,700	2.0
Primary Education	66,100	2.2
PVE Technical	59,200	2.3
UE Theology	900	2.3
IVE Non-medical Laboratory	1,400	2.5
HVE Teacher training	33,500	2.5
UE Veterinary and Medical Sciences and Dentistry	6,400	2.5

PVE = Preparatory Vocational Education
IVE = Intermediate Vocational Education
HVE = Higher Vocational Education
UE = University Education

Source: ROA

In relative terms it is mainly some kinds of University Education from which large flows of graduates are expected to enter the labour market. The established trend for increasing proportions of the working population to be university educated will thus continue in the coming years. The largest flow, in proportional terms, is expected for the rather small education type 'University Education, Fine Arts', for which the flows of graduates entering the labour market each year amount to as much as 10% of the total employment offered. University Education in 'Agriculture' is also expected to produce high relative flows. It is also striking that University Education in 'Engineering', despite the disquieting reports at present doing the rounds, is still

expected to produce a fairly high number of graduates entering the labour market in the period 1993-1998. The expected flows from 'University Education, Economics, Econometrics, and Business Administration' are also relatively high, but clearly lower than was expected for the period 1989-1994.

The list of types of education expected to produce low relative flows of school-leavers for the labour market is very heterogenous, and includes types of education at all levels. The lowest flows entering the labour market are expected from Preparatory Vocational Education for 'Transport and Harbour', with expected annual flows of just 0.6% of the numbers already in employment. It is also striking that the flows from University Education in 'Veterinary and Medical Sciences and Dentistry' are also relatively limited. This is apparently related to the fixed quota system which limits the number of students who may be accepted for many of the courses which are included in this category.

3. THE MARKET POSITION OF OCCUPATIONS AND TYPES OF EDUCATION

3.1. Introduction

With the consideration of the flows of school-leavers, which were described in the previous chapter, we now have some insight as to the changes in demand and supply which are to be expected on the labour market in the period 1993-1998. This information is still not sufficient to give a good picture of the relative market position of occupations and types of education from the point of view of those seeking or offering employment.

This chapter will examine the position of occupations and types of education on the labour market in more detail, distinguishing between the *current market position*, the *future market position* and the more or less structural *risk position*. Diagram 3.1 shows which indicators determine the diverse elements of the market position of occupations. Although ROA's information system is primarily focused on new entrants, the data can also be relevant for those offering employment. Therefore the diagram shows how both those seeking labour and the new entrants to the labour market would evaluate each value of an indicator.

Figure 3.1. Elements of the market position of occupations

Indicator	employers	new entrants
Current market position		
large number of (hard to fill) openings	−	+
Future market position		
large number of job openings	−/+	+
of which: high expansion demand	−/+	+
high replacement demand	−/+	+
Risk position		
highly dependent on school-leavers	−	+
high average age of workers	−	
very cyclically sensitive	−	−
many employment alternatives		+

− = unfavourable
+ = favourable

The *current market position* of occupations will be characterized on the basis of the number of job openings and the percentage of openings which are hard-to-fill. Those seeking labour will naturally consider a situation in which there are many openings, especially if these are difficult to fill, unfavourable. The new entrants to the labour market, on the other hand, will benefit from a large unsatisfied demand.

The *future market position* of occupations will be determined on the basis of the total demand for new entrants (job openings) which was set out in chapter 2. For new entrants in the labour market, of course, the greater the demand, the better their future market position will be, but it is not clear how the volume of demand will be viewed by those on the demand side of the labour market. In the broadest terms, higher expansion demand as a result of the expansion of business activities should, for an employer, be seen as favourable. Seen purely in terms of the labour market, this means that businesses will have to devote more effort to recruitment, leading moreover to increased competition between businesses on the labour market. On the other hand, expanding employment in a given occupation usually also stimulates the supply of labour, both directly and indirectly due to the positive image that the work involved will gain as a result of the strong growth in employment opportunities.

High replacement demand appears in general to be unfavourable. A high turnover rate may indicate that those already working find the working conditions unattractive. It can also mean that employers are very much dependent on workers without strong ties to the labour market or that they have to cope with high turnover as a result of having many older personnel. High replacement demand also means that, in the near future, many more or less experienced workers will be lost to the occupation, that a considerable portion of their knowledge will be lost to the employer, and moreover that many new entrants will have to be recruited. It is however also possible that workers' knowledge, especially that of older workers, may be rather outdated. If these people withdraw from the labour market and can be replaced by young and well-educated new entrants, this is favourable for the employer. From this point of view, a low replacement demand would be unfavourable, since it means that little new blood is being recruited. All in all, from an employer's point of view, an average replacement demand which will more or less maintain a balanced mix in the occupation of older, more experienced, workers and young well-educated new entrants is the most favourable situation.

It is important to understand that there is an essential difference between the number of job openings and the total number of vacancies which arise in a given period. The flow of vacancies will, by definition, be larger than the number of job openings, since workers' job mobility within a given occupational class will lead to new vacancies, and in some cases to a chain of vacancies, yet the net effect will not be to produce additional job openings for new entrants (see De Grip, Meijboom and Willems, 1993). This difference between the total number of vacancies and the actual job openings will be greater in the high periods of the business cycle, when relatively many workers switch jobs.

The *risk position* of those seeking workers, and of new entrants to a particular occupational segment in the labour market, has been defined with the aid of four indicators. The first indicator relates to the degree of dependence on school-leavers. For potential employers, strong dependence on flows of school-leavers is unfavourable, considering the expected fall in the numbers of young people in the working population. For new entrants to the labour market, especially the younger ones, such dependence is favourable because a relatively large part of the job openings are directly available for them, which increases the opportunities available to them on entering the market. The next risk factor is the extent to which an occupational class

is affected by the rising age of the population. For potential employers, a large degree of ageing entails the risk that, in the future, there will be increasing 'knowledge obsolescence', which may lead to higher education costs for employers. In fact the problem of ageing has already been encountered in discussing the replacement demand. The degree of aging, considered as a more direct measure of the risks of knowledge obsolescence in the somewhat longer term, supplements that discussion.

The third risk indicator to be considered is the sensitivity of employment to business cycles. A high degree of sensitivity is unfavourable for those on both the demand and supply sides of the labour market. For those seeking to employ labour, high cyclical sensitivity results in a relatively weak competitive position on the labour market, which increases the likelihood of problems in recruiting new personnel, especially when the business cycle is on the rise. These recruitment problems will very likely have to be compensated for, with higher wages or other favourable working conditions. For new entrants to the labour market, occupations in which the level of employment is very sensitive to the state of the economy are naturally seen negatively because of the limited job security which the choice of such an occupation offers.

The last of the four indicators is a measure of the opportunities of switching to other sub-sectors. For employers this is not very important,[11] but for those offering their labour, having many alternative opportunities can be seen as favourable, because a larger part of the labour market is then accessible to them. Where demand is stagnant, the new entrants then have more possibilities of finding work in other segments of the labour market.

Figure 3.2. Elements of the market position of types of education

Indicator	new entrants
Current market position	
high unemployment	−
high incidence of under-utilization	−
Future market position	
good labour market prospects	+
Risk position	
many employment alternatives	+

− = unfavourable
+ = favourable

The market position of the various types of education is discussed only from the perspective of new entrants to the labour market. Once again a distinction has been made between the current market position, the future market position and the risk position. Figure 3.2 provides an

11. A high degree of flexibility in the supply of labour means that the employers face greater risks of losing their employees, but this flexibility need not necessarily be determined by the possibility of switching to other economic sectors.

overview of the various components of the market position of types of education from the point of view of new entrants to the labour market.

One of the most important indicators determining the *current market position* of types of education is the current unemployment rate. This reveals existing problems of quantitative mismatches between the education system and the labour market. There may also be mismatches in qualitative terms. These emerge where excess supply in a particular segment of the labour market forces those offering their labour to accept a job below their level. The percentage of workers whose present jobs under-utilize their qualifications can therefore also be seen as an indication of the current market position.

Chapter 2 described the flows on the demand and supply sides of the labour market for the various types of education. When the demand flows are matched against the supply we get a picture of the *future market position* of the various types of education. The *risk position* of types of education is characterized on the basis of the alternative occupations open to those with a given educational background. Only alternative occupations at a job-level matching that of the person's education, or higher, are considered, since only these occupations offer alternatives which strengthen the new entrant's market position.

3.2. The market position of occupations

Current market position

As already mentioned, the current market position of occupations can be defined on the basis of the number of job vacancies. The two most important data sources which are available for the purpose are the registers of the Regional Employment Boards and the survey of vacancies conducted by the CBS. Each of these sources has specific drawbacks. The most important objection to the Regional Employment Boards' registers is that only a limited portion of the vacancies are registered with them (see Allaart, Praat and Vosse, 1992) and this data therefore seriously under-measures the total difficulty with vacancies. The CBS data does not suffer this drawback, but has the serious disadvantage that a number of important sectors, such as the government and the education system, are not included in the survey. Nevertheless the CBS data will enable us to draw comparisons between most occupational classes, showing how difficult it is to fill vacancies for each class. However for occupational classes which are linked very closely to the government sector, such as teachers, no reliable figures for vacancies can be given.

Table 3.1. Occupational classes with the highest vacancy rates, and with the greatest proportion of hard-to-fill vacancies, September 30 1992*

ROA-code	occupational class	vacancy rate %	hard-to-fill vacancies %
High vacancy rate			
3022	Technical and medical representatives	4	33
3613	Welders and engineering workers	2	60
3912	Roofing, concrete, and insulation workers and glaziers	2	50
3914	Plumbers	2	80
6211	Sales assistants	2	25
3911	Bricklayers, tilers, paving workers, and plasterers	2	78
3631	Higher mechanical engineers	2	33
6126	Telephonists, receptionists and pollsters	2	17
5035	Dentists and dental specialists	2	100
3721	Electricians and electrical and telecommunication servicemen	2	38
8111	Cooks, waiters and kitchen workers	2	28
3311	Wood, paper and cardboard product workers	2	0
8221	Hairdressers and beauticians	2	60
3111	Food and beverage processors	2	38
4112	Sailors, deckhands and engine-room workers	2	0
8211	Porters, cleaners and domestics	2	39
3921	Surveyors, quantity surveyors, work clerks, construction technicians	2	50
7033	Community workers and probation officers	2	22
Many hard-to-fill vacancies			
5035	Dentists and dental specialists	2	100
5033	Physicians, medical specialists, pharmacists	1	100
5024	Pharmacy assistants, opticians and orthopaedists	1	100
3914	Plumbers	2	80
3911	Bricklayers, tilers, paving workers, and plasterers	2	78
3915	Construction workers, road construction and sanitation workers	1	67
3913	Painters (not spray painters)	1	67
3614	Lathe operators, sheet-metal workers, tool and model makers	1	67
3012	Construction machine operators	1	67

* Excluding vacancies in government service, the education system, sheltered workshops, and temporary employment bureaus.

Source: CBS vacancy survey/ROA

Table 3.1 shows the occupational classes with the highest rate of vacancies and proportionately the most hard-to-fill vacancies.[12] The first general impression is that the vacancy rate is low right down the line. The occupational class of 'Technical and medical

12. The vacancy rate is defined as the total number of unfilled vacancies as a proportion of the total numbers working in that year. The percentage of hard-to-fill vacancies must be interpreted with some caution, considering the subjective character of the data, particularly where the vacancy rate is low. Moreover, there are only a small number of vacancies in several occupational classes, so that substantial rounding-off errors can arise in determining the percentage of vacancies which are hard-to-fill.

representatives' has, in proportional terms, the largest number of unfilled vacancies. It is also striking that a number of lower technical occupations, in particular, have relatively high vacancy rates. For some of these occupations the percentage of hard-to-fill vacancies is also very high. However the greatest strain in the labour market seems to focus on the medical and paramedical occupations. Suitable candidates are hard to find for a very large proportion of the vacancies. This is so not only for doctors (i.e., for doctors working as employees), but, surprisingly, also for a number of supporting occupations in health care.

Future market position

The future market position of occupations has been characterized on the basis of the expected expansion and replacement demand for each occupational class, as was described in detail in the previous chapter. In light of the data on vacancies which has been presented, it can again be noted that relatively high numbers of job openings are expected to be found mainly for various medical and paramedical occupations. This means that the present favourable situation for new entrants to the labour market in medical fields, as evidenced by the high percentage of hard-to-fill vacancies, will continue for the immediate future. However for the lower technical occupations, for which there are at present hard-to-fill vacancies, a worsening of the market position of new entrants to the labour market is expected in the near future, as a result of the limited number of job openings.[13]

Risk position

As was said above, four indicators will be used to determine the risk position of a given occupational class: dependence on school-leavers, the degree of ageing, the sensitivity of employment to business cycles and the opportunities of switching to other sub-sectors.

The top part of table 3.2 shows the occupational classes with the highest percentages of workers under 30 years old. These occupational classes are very dependent on the flows of school-leavers onto the labour market. The table shows that occupational classes in which most workers have a low or intermediate level of education also have a high portion of workers under 30 years old.[14] Relatively many of those working in the occupational class of 'Hairdressers and beauticians', in particular, are young. It is not surprising that the occupational class of 'Student nurses and home nursing personnel' also contains relatively many young people. Naturally any deficiency in the flows entering the nursing and community care occupations will show up first in this occupational class. Both occupational classes could be called typical 'women's professions' (see ROA, 1992). That is in fact also true for 'Doctor's, dentist's, and

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13. The future situation may however vary in the various specialised fields within these occupational classes.

14. The indicator gives a somewhat biased picture of dependence on school-leavers, since those with higher education study for longer, so that the portion of these workers under 30 years old is automatically lower.

veterinary assistants', for which the degree of dependence on school-leavers is also relatively high.

Table 3.2. Occupational classes with the highest percentages of workers younger than 30 years old, and older than 50, averages for 1988-1992

ROA code	occupational class	%
Most young workers		
8221	Hairdressers and beauticians	60
5022	Student nurses and home nursing personnel	59
5023	Doctor's, dentist's, and veterinary assistants	57
6211	Sales assistants	55
3112	Bakers and bakery personnel	52
8111	Cooks, waiters and kitchen workers	50
3111	Food and beverage processors	48
6112	Data typists and computer operators	47
4011	Freight handlers, packers, and packaging workers	47
3621	Automobile and (motor) cycle mechanics	47
Most older workers		
1231	Pastoral vocations	44
2012	Farmers	37
6221	Shopkeepers, retail and wholesale staff	26
4121	Ship's officers and marine inspectors	25
3021	Directors, managers and supervisors in manufacturing	23
6331	Senior civil servants	22
4321	Pilots, flight engineers, transport supervisors and inspectors	21
3931	Architects, civil engineers and city planners	21
0133	School principals and other higher educational professions	21
3921	Surveyors, quantity surveyors, work clerks, construction technicians	20

Source: CBS/ROA

The lower part of table 3.2 shows the occupational classes with the highest rate of 'ageing'. It is particularly for several occupational classes in which most or all of those working are self-employed that the proportion of older people is notably high. It is also hardly surprising that older people are relatively well-represented in a number of management occupations. The occupational class 'Pastoral vocations', however, has the highest percentage of workers at or above 50 years old. This is a clear indication of the limited attraction of these occupations for young people. All in all, in fact, we can conclude that the higher risk position of various occupations, which might be expected to arise with the aging of the working population, will in the medium term not be too serious, since the proportionately large number of older people in many of the occupational classes listed in table 3.2 is closely linked to the nature of the activities and responsibility involved in these occupations. Over a somewhat longer period it is however possible that the problem will get worse, as the post-war 'baby boom' generation begins to turn 50.

Table 3.3 shows the occupational classes for which employment is relatively very sensitive or insensitive to the business cycle. It is striking that the occupational classes with a relatively high sensitivity are all lower-level technical and industrial occupations and trades. In contrast, the occupational classes with strong links to the government, such as 'Primary and special education teachers' and 'Military professionals' are characterized, at least as far as cyclical variations in employment goes, by relatively high degrees of job security.[15] Employment in a number of agricultural and transport occupations is also, as compared to other occupational classes, relatively insensitive to the state of the business cycle. The occupational class of 'Bakers and bakery personnel' also suffers very little from the results of cycle fluctuations in the general level of employment.

Table 3.3. Occupational classes with the highest, and with the lowest, sensitivity to cyclical fluctuations

ROA code	occupational class	sensitivity indicator
High		
3211	Textile production workers	3.74
3913	Painters (not spray painters)	3.36
3911	Bricklayers, tilers, paving workers, and plasterers	3.34
3213	Clothing, textile and fur product makers	3.31
3912	Roofing, concrete, and insulation workers and glaziers	3.27
3914	Plumbers	3.14
3711	Electrical product assembly workers and quality controllers	2.90
3312	Carpenters and woodworkers	2.86
3612	Metal-processing machine operators	2.66
3915	Construction workers, road construction and sanitation workers	2.60
Low		
2012	Farmers	0.99
0131	Primary and special education teachers	1.01
9221	Military professionals	1.01
0132	Secondary and tertiary education teachers	1.04
6331	Senior civil servants	1.08
4112	Sailors, deckhands and engine-room workers	1.11
3112	Bakers and bakery personnel	1.11
9121	Military professionals	1.14
0133	School principals and other higher educational professions	1.15
4121	Ship's officers and marine inspectors	1.15

Source: ROA

Table 3.4 gives an overview of the occupational classes with many, and with few opportunities of switching to other sub-sectors.[16] It can be seen that a number of technical and industrial occupations and trades and a number of commercial and administrative occupations enjoy

15. In view of the current reorganisation of the defense forces, the job security of military professionals may, in the short term, be somewhat reduced.

16. These figures are determined using the Gini-Hirschman dispersion coefficient (see the glossary of central concepts at the end of this report).

particularly broad opportunities for horizontal mobility in the labour market. This means that those working in these occupations can, in the event that demand in one sector dwindles, easily find places in other sectors, without having to change their occupation. Occupational classes for which the labour market is strictly regulated, such as occupations in the educational and health care systems, are characterized by the limited flexibility of workers in the labour market. Of these, the military professionals face the most limited opportunities to find a place in some other segment of the labour market. 'Dentists and dental specialists' and 'Hairdressers and beauticians' also have very limited opportunities of switching to other economic sub-sectors.

Table 3.4. Occupational classes with many, and with few, opportunities for switching to other sub-sectors, averages for 1988-1992

ROA code	occupational class	dispersion index
Many		
3615	Machinery mechanics and bicycle and instrument makers	0.98
6031	Senior finance and sales managers	0.97
3021	Directors, managers and supervisors in manufacturing	0.97
3011	Forklift drivers	0.96
6125	Purchasing and sales clerks	0.95
4011	Freight handlers, packers, and packaging workers	0.95
6126	Telephonists, receptionists and pollsters	0.95
3622	Intermediate mechanical engineers and marine engineers	0.94
4321	Pilots, flight engineers, transport supervisors and inspectors	0.94
6122	Secretaries and typists	0.94
Little		
9221	Military professionals	0.03
5035	Dentists and dental specialists	0.07
8221	Hairdressers and beauticians	0.07
5023	Doctor's, dentist's, and veterinary assistants	0.08
2012	Farmers	0.11
0132	Secondary and tertiary education teachers	0.12
0131	Primary and special education teachers	0.13
3112	Bakers and bakery personnel	0.15
3911	Bricklayers, tilers, paving workers, and plasterers	0.17
5021	Registered nurses, district nurses and midwives	0.21

Source: ROA

Summary

This section has shown that the market positions of the diverse occupations can differ very widely. Nevertheless a number of clusters of occupational classes with the same 'typical' market position can be identified. In the first place, the medical and paramedical occupations are in general characterised by a relatively close relationship between the economic sector and

occupation, so that the alternatives open to these professionals in the labour market are relatively limited. The total future demand for a number of these occupational classes is however expected to be relatively high, especially for the occupational classes 'Dentists and dental specialists', 'Doctor's, dentist's, and veterinary assistants' and 'Registered nurses, district nurses and midwives'. There are at present a considerable number of hard-to-fill vacancies for dentists and dental specialists. The occupational class of 'Doctor's, dentist's, and veterinary assistants' is also very dependent on school-leavers, which, as the proportion of young people in the working population continues to fall, also contributes to recruiting difficulties.

A second cluster of occupational classes is made up of the lower level technical and industrial occupations and trades. These occupations are characterized mainly by very great sensitivity to the state of the economy, which means that these occupations have a poor structural position on the labour market. At present there is tension in the labour market for a number of these occupational classes, as indicated by the relatively high percentage of hard-to-fill vacancies. However for these occupational classes the demand in the coming five years for new entrants is expected to be fairly low.

A third cluster of occupational classes combine low cyclical sensitivity with limited opportunities for mobility to other sub-sectors. These characteristics apply mainly to several occupational classes with strong links to government, such as teachers and public security and safety occupations. It can however be noted that a small decrease in employment is expected for the occupational class of 'Primary and special education teachers'.[17]

3.3. The market position of types of education

Current market position

Unfortunately there is as yet no data available on current unemployment among the working population, differentiated by type of education. The available data is differentiated only in broad educational categories (see also chapter 1). Two large-scale questionnaire-based research projects, the *"Registration of Flows and Destinations of school-leavers"* (RUBS survey) and *Higher Vocational Education Monitor*, do enable us to form a detailed picture of unemployment among school-leavers.[18] This data does not however comprise a picture covering the unemployment among school-leavers over the full width of the labour market, since for University Education no such research has, unfortunately, been carried out to date.

A less favourable current market position may however, as already noted, be manifest not only in higher unemployment, but also in a higher degree of under-utilization (i.e., 'over-education).

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17. However, the IVA research institute expects (IVA, 1992) an increase in employment for teachers in primary education.

18. Chapter 4 will examine unemployment as regards Higher Vocational Education.

This occurs if workers, willingly or otherwise, find places in jobs which are too low in relation to their education. Table 3.5 shows the types of education with the highest, and with the lowest, rates of under-utilization in 1992. These results must however be interpreted with caution, since the measure of under-utilization which has been used (that compiled by Huijgen (1989)) is not really sufficiently discriminating. With the aid of the data from the *RUBS survey* and the *Higher Vocational Education Monitor,* a better idea of the under-utilization of school-leavers and recent graduates can be formed. This data is however not available for all types of education, and moreover does not cover all of those working, so that Huijgen's measure has been used in this case as well.

Table 3.5. Types of education with the highest, and with the lowest, rates of under-utilization, 1992[a]

Type of education	%
High	
PVE Transport and Harbour	81
PVE Security	80
HVE Police, Fire and Defense Forces	64
PVE Community Care, Hotel and Catering	58
IVE Community Care	57
IVE Transport and Harbour	54
IVE Police, Fire and Defense Forces	53
PVE Agriculture	49
HVE Commerce and Administration	47
IVE Agriculture	47
UE Fine Arts	47
Low	
UE Veterinary and Medical Sciences and Dentistry	6
UE Pharmacy	7
HVE Nursing and Paramedical Services	9
HVE Medical Laboratory	9
IVE Medical Laboratory	11
HVE Engineering	11
HVE Non-medical Laboratory	11
UE Teacher training	11
IVE Nursing and Paramedical Services	12
HVE Teacher training	14

[a] There is no under-utilization for 'Primary Education', since this is impossible given the definitions which have been applied.

PVE = Preparatory Vocational Education
HVE = Higher Vocational Education
IVE = Intermediate Vocational Education
UE = University Education

Source: ROA

It can be seen that it is particularly workers who have completed a course of study at the level of Preparatory or Intermediate Vocational Education level whose qualifications are under-

utilized. The highest rate of under-utilization found was for Preparatory Vocational Education in 'Transport and harbour'. As many as 81% of those working with this educational background are employed at too low a level. It is also striking that both Higher and Intermediate levels of vocational education for 'Police, Fire and Defence Forces' suffer a high rate of under-utilization. This is in part attributable to the classification of job levels which has been used, which does not allow adequate distinctions to be made between the various functional categories within the police and defence forces.

It is also striking that there is a high rate of under-utilization for Higher Vocational Education in 'Commerce and Administration'. About half of those working with this educational background have a job for which Higher Vocational Education is not required. It should however be noted that for this type of education the indicator of under-utilisation which has been used may give a biased picture because of the out-of-date classification of levels in the diverse commercial and administrative occupational groups. For example, the *Higher Vocational Education Monitor* shows that just 19% of working graduates consider that they are working at too low a level, a percentage scarcely different from that for other types of Higher Vocational Education (see also chapter 4 of this report). Moreover De Grip, Heijke and Willems (1992) show that young workers often work at a lower level, to be followed by promotion through internal labour markets to functions which do match their education level. This may play some role, especially for Higher Vocational Education in 'Commerce and Administration', for which employment has grown rapidly in recent years. Young people holding such first-entry jobs may not themselves see this as under-utilization of their capacities, because of the opportunities for advancement which are open to them within the organisation in which they are working.

It is notable that the degree of under-utilization is especially low for types of medical education. For 'laboratory' education in both non-medical and medical fields (the latter includes, at the highest level, pharmacy), the percentage of workers whose qualifications are under-utilized is also low. Higher Vocational Education in Engineering also has relatively low under-utilization, and fairly few workers with an educational background in 'Teacher training' at University or Higher Vocational Education level work at a level which is not comparable to the level of their education.

Future market position

For those facing educational choices at present it is not so much the current unemployment which is important, but rather the labour market situation at the time that they will first be seeking a job at the end of their initial education. Bringing together the expected flows in the labour market for the coming years which were described in chapter 2 gives an indication of the future labour market prospects of each type of education.[19]

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19. Use has been made here of the 'indicator of the future labour market situation' which ROA has developed. See the list of key concepts at the end of this report.

Table 3.6 provides an overview of the types of education whose labour market prospects are expected to be good. The table shows that the future labour market situation for new entrants to the labour market from medical education will be especially favourable. These favourable prospects result mainly from the relatively low future flows of graduates from these types of education, while the expected relative demand for workers is about the same as the national average for all types of education. The table also shows that good labour market prospects are expected for a number of types of education in the technical fields. For example, it can be seen that it is not only the pharmacy and medical laboratory courses which offer favourable prospects in the labour market, but also non-medical laboratory education, University Education in Mathematics and Natural Sciences, and Higher Vocational Education in Engineering. For the latter two types of education, relatively large numbers of job openings are expected, while the expected flow of graduates entering the labour market is about the same as the national average over all types of education.

Table 3.6. Types of education with good expected labour market prospects, 1993-1998

Type of education	indicator of future market prospects
HVE Transport and Harbour	0.81
UE Theology	0.82
IVE Medical Laboratory	0.84
UE Veterinary and Medical Sciences and Dentistry	0.87
HVE Medical Laboratory	0.87
UE Pharmacy	0.92
UE Mathematics and Natural Sciences	0.95
IVE Administrative, Legal and Fiscal	0.96
HVE Engineering	0.96
IVE Non-medical Laboratory	0.96
HVE Non-medical Laboratory	0.96
PVE Agriculture	0.96

PVE = Preparatory Vocational Education
HVE = Higher Vocational Education
IVE = Intermediate Vocational Education
UE = University Education

Source: ROA

Table 3.7 provides an overview of the types of education which are expected to face bad labour market prospects in the period 1993-1998. It is striking that only 6 of the 49 types of education which have been differentiated here face labour market prospects which would have to be called bad. In ROA's previous forecast, for the period 1989-1994, 14 types of education were said to face bad labour market prospects. The 6 types of education listed in table 3.7 also had bad labour market prospects at that time. The falling number of types of education with bad labour market prospects can be simply explained from the increasing average age of the population and especially the working population. More older people will leave the labour market and less young people are entering.[20]

20. However, part of the difference can also be attributed to improvements in the forecasting method.

The absorption problems which, as a result of the economic recession are affecting the full width of the labour market are therefore expected to be temporary. As has been said, in the medium term, new entrants from only a few types of education are expected to face bad labour market prospects. It is however striking that a number of university disciplines are expected to have bad prospects, mainly due to high flows of graduates entering the labour market (see table 2.13). The future market position of drop-outs from secondary education,[21] still a very extensive group, is also expected to be bad. This applies equally to Senior General Secondary Education.[22] It would appear that school-leavers with this broad liberal education are not sufficiently equipped to win good positions in the labour market of the future. Finally, for 'Intermediate Vocational Education, Social and Cultural', bad labour market prospects are also expected.

Table 3.7. Types of education with bad expected labour market prospects, 1993-1998

Type of education	indicator of future market prospects
UE Fine Arts	1.32
Primary Education	1.25
Senior General Secondary Education	1.23
IVE Social and Cultural	1.21
UE Agriculture	1.19
UE Arts	1.11

IVE = Intermediate Vocational Education UE = University Education

Source: ROA

Risk position

It is important to understand that types of education for which bad labour market prospects are expected will not automatically suffer increasing unemployment. Equally, good labour market prospects do not automatically mean that all school-leavers with that particular educational background will find suitable work. School-leavers from types of education with a quantitatively unfavourable labour market situation may, if their educational background permits, shift to other segments of the labour market in which the prospects are brighter.

Table 3.8 gives an outline of the possibilities of switching to other occupational fields. Only the possibilities of shifting to occupations at a matching or higher job level have been considered. Opportunities of switching to occupations at a lower level, i.e, jobs in which the worker's

21. These appear in the figures under 'Primary Education'.

22. Those who leave school without a diploma after the fourth year of Senior General Secondary Education are also, on the basis of the CBS classification, included in this type of education.

qualifications would be under-utilized, have not been considered since substitution processes of this kind do not in fact lead to a better market position. Only the way in which a bad market position is made manifest changes in that case: the unemployment situation is, as it were, ransomed off by accepting a job at a lower level. The under-utilization which results has already be discussed as a separate indicator of labour market positions.

Table 3.8. Types of education with many, and with few, opportunities of switching to occupations at a corresponding or higher function level, 1990-1992

Type of education	dispersion index
Many	
Primary Education	0.98
PVE Technical	0.97
IVE Engineering	0.97
HVE Engineering	0.96
UE Engineering	0.96
IVE Commerce and Administration	0.95
HVE Transport and Harbour	0.95
Junior General Secondary Education	0.95
Senior General Secondary Education	0.95
IVE Transport and Harbour	0.95
HVE Agriculture	0.95
Few	
UE Veterinary and Medical Sciences	0.51
UE Theology	0.59
UE Medical Laboratory	0.62
PVE Transport and Harbour	0.67
IVE Non-medical Laboratory	0.70
HVE Medical Laboratory	0.71
IVE Medical Laboratory	0.71
UE Teacher Training	0.73
IVE Nursing and Paramedical Services	0.74
PVE Agriculture	0.74

PVE = Preparatory Vocational Education
IVE = Intermediate Vocational Education
HVE = Higher Vocational Education
UE = University Education

Source: ROA

It is not surprising that school-leavers from general secondary education, in particular, have many opportunities to switch to other occupational fields. It also appears that courses in technical and engineering fields at all levels provide a high degree of flexibility in the labour market. It must be remembered that, within the broad category of 'technical' education, there are many specific fields of study which are not separately considered here. For many of these specific subjects, the possibilities of switching to other occupational fields are much more limited (see Wieling, De Grip and Van der Velden, 1992).

The lower part of table 3.8 shows that it is mainly types of education which train students for specific occupations, many of which are found in health care and the educational system, which offer few opportunities to shift to other occupational fields. University Education in theology is another course that trains students mainly for one occupational field and therefore offers few opportunities for switching to other occupations. There are generally also narrowly prescribed educational prerequisites for the relevant fields of employment. This has the advantage, for those seeking work, that they face little competition in this professionally specified segment of the labour market from people from other occupational backgrounds. On the other hand their own opportunities of switching to other occupational groups are, as a result of the high specificity of their education for a specific occupation, rather limited.

Summary

On the basis of the indicators which have been discussed above, a number of clusters of types of education with similar market positions can be identified. The clearest cluster consists of types of education in the medical and laboratory fields, of which the most important are University Education in the fields of 'Veterinary and Medical Sciences and Dentistry' and 'Pharmacy' and the Intermediate Vocational Education course in 'Medical Laboratory'. The future prospects of people with these types of education, on the labour market, are good, and their degree of under-utilization is at present low. This indicates a very good market position for new entrants to the labour market with this educational background. However there is a negative aspect, in that these types of education offer relatively limited opportunities for switching to other occupational groups. This means that choosing one of these courses entails the risk that, should the demand lag behind supply, for example as a result of abrupt changes in policy in the health and community care sector, it will probably be difficult to find other work elsewhere at the desired level.

A favourable market position is also expected for 'Higher Vocational Education, Engineering'. The prospects for this type of education are good, while a relatively low percentage of workers are under-utilizing their qualifications.[23] Furthermore, people with this educational background can find work in many occupational classes. Good labour market prospects are also expected for 'University Education, Mathematics and Natural Sciences', and the degree of under-utilization for this type of education is relatively low.

Those who have not completed any vocational education or preparatory vocational education have a bad market position. The expected labour market prospects are especially bad for those without qualifications and for school-leavers from 'Senior General Secondary Education'. On the other hand, there is a relatively broad range of employment options for these types of education. Three kinds of University Education, in 'Fine Arts', 'Agriculture', and 'Arts', are also expected to face bad future labour market prospects. Many workers with the first of these educational backgrounds are at present working in a job which is below their education level.

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23. However, it would appear from the *Higher Vocational Education Monitor* that graduates from 'Higher Vocational Education, Engineering' are at present encountering some problems in finding a job.

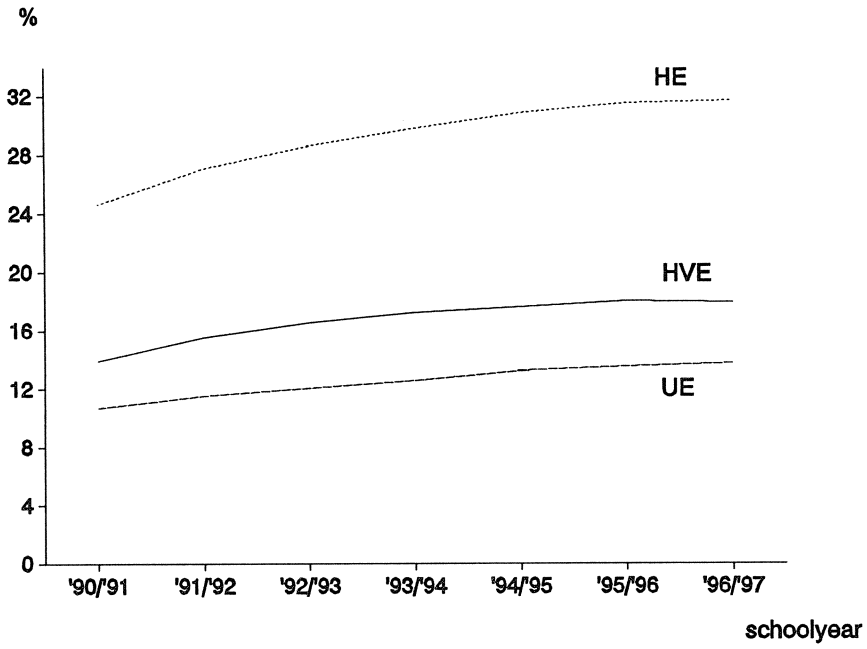
Finally, a quite remarkable market position has been found for 'Preparatory Vocational Education, Agriculture'. Good labour market prospects are expected for this type of education, but it can be seen that at present many workers who have this education are under-utilized. Moreover the options for shifting to other occupational groups with this type of education are limited.

4. HIGHER EDUCATION IN MORE DETAIL

4.1. Introduction

Until recently it was simply assumed that a high educational level for the working population was in the public interest. Because of this supposition, people have always been encouraged to undertake higher education. Partly as a result, participation in higher education has grown enormously in recent decades. In the last few years, however, it is increasingly being asked how many of the growing number of people with higher education will be able to find a function in the labour market which is renumerated according to their educational level. In this climate, some are also pointing to the need to slow the flows within higher education of students 'stacking' successive qualifications (Ministerie van Onderwijs en Wetenschappen, 1993a).

Figure 4.1. Percentages of those completing their initial education in 1990/1991-1996/1997 who held higher educational qualifications



Source: Ministerie van Onderwijs en Wetenschappen (1993b)/ROA

Figure 4.1 shows changes in the proportions of all those leaving their initial regular education in the period 1990/1991-1996/1997 with some qualification who held higher educational qualifications. The total flow of graduates from higher education as a whole (HE) is differentiated there into flows from University Education (UE) and from Higher Vocational Education (HVE). In the period 1990/1991-1992/1993, the share of those with higher education in the total flow of those with some qualification increased from 25% to 29%. This growth is chiefly due to Higher Vocational Education. For the period 1993/1994-1996/1997,

this is expected to increase further, until 32% of the total flows of students gaining some qualification in their initial education will have higher educational qualifications. The percentage of those with University Education is expected to increase somewhat faster than the percentage with qualifications from Higher Vocational Education.

This chapter will examine in more detail whether the labour market will be able to absorb the sharply increased supply of workers with higher education. It will begin by scrutinizing the market position of the so-called 'higher' occupations: occupations in which more than half of those practising the occupation have been trained in Higher Vocational Education or University Education.[24] Then the market position of the various types of education in Higher Vocational Education and University Education will be discussed. The sequence will be the same as in the previous chapter, giving an outline of the current market position, the future market position and the risk position in that order, preceded by an overview of the market share of the diverse higher occupational classes and types of education. Finally a more detailed description is given of the current market position and risk position of recent graduates from Higher Vocational Education, using data derived from the *Higher Vocational Education Monitor*. Unfortunately there is at present no equivalent of this monitor for recent university graduates, so that no picture can be given of their market position.

4.2. The market position of higher occupations

Market share

Table 4.1 gives a picture, for the period 1988-1992, of the average numbers working in the higher occupations as a percentage of the total number of workers. Of the total number of those working, almost 18% appear to be employed in the higher occupations, with the educational occupations forming one important vocational field. Around 3% of the total number of those working are found in the occupational class of 'Secondary and tertiary education teachers'. There are also many people with higher education working as 'Primary and special education teachers'. In total those working in the educational occupations comprise more than 5% of total employment. This means that around one third of the employment in the higher occupations relates to these educational occupations. The large numbers working in the relatively new occupational class of 'System analysts, programmers, and system supervisors' is striking. Moreover, many of those with higher education work in the occupational class of 'Senior finance and sales managers'. Almost 6% of all workers are engaged in the higher commercial and administrative occupations. More than 2% of the total number of those working have an occupation that falls under the higher socio-cultural occupations. Almost 2% of the total workforce work in the higher technical occupations. The higher medical and paramedical occupations represent almost another 2% of the total employment.

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24. In ROA's classification system these occupational classes have a code number in which the third digit is a 3. In total 24 of ROA's occupational classes are 'higher' occupations.

Table 4.1. Employment in the higher occupations, in absolute numbers and as a percentage of the total numbers employed, averages for 1988-1992

ROA code	occupational class	number	%
	Educational occupations		
0131	Primary and special education teachers	100,000	1.8
0132	Secondary and tertiary education teachers	150,000	2.7
0133	School principals and other higher educational professions	40,000	0.7
	Cultural occupations		
1131	Translators and other literary professions	6,000	0.1
1231	Pastoral vocations	10,000	0.2
1331	Visual and performing artists	29,000	0.5
	Technical and industrial occupations		
3031	Scientific researchers and engineering specialists	51,000	0.9
3631	Higher mechanical engineers	14,000	0.2
3731	Higher electrical engineers	18,000	0.3
3931	Architects, civil engineers and city planners	29,000	0.5
	Medical and paramedical occupations		
5031	Physiotherapists and occupational therapists	36,000	0.6
5032	Radiological, medical and biological laboratory professionals	26,000	0.5
5033	Physicians, medical specialists, pharmacists	35,000	0.6
5035	Dentists and dental specialists	6,000	0.1
	Commercial and administrative occupations		
6031	Senior finance and sales managers	97,000	1.7
6131	System analysts, programmers and system supervisors	111,000	2.0
6132	Accountants and economists	51,000	0.9
6331	Senior civil servants	28,000	0.5
6332	Legal professionals	29,000	0.5
	Socio-cultural occupations		
7031	Librarians, archivists and curators	4,000	0.2
7032	Personnel officers, vocational advisors and employment agents	25,000	0.4
7033	Community workers and probation officers	60,000	1.1
7034	Social scientists	22,000	0.4
7035	Information service and media specialists	17,000	0.3
	Total	1,000,000	17.8

Source: CBS/ROA

Current market position

Table 4.2 gives a picture of the vacancy rate and the percentage of hard-to-fill vacancies for the higher occupations. As has already been noted in chapter 3, vacancies in the sectors of government and the education system, along with those at sheltered workshops and temporary employment agencies, are not included in these figures, so that vacancies in the occupational classes of 'Primary and special education teachers', 'Secondary and tertiary education teachers', 'School principals and other higher educational professions' and 'Senior civil servants' are not registered, or only to a small degree.

Table 4.2. Vacancy rates and percentages of hard-to-fill vacancies for the higher occupations, September 30 1992*

ROA code	occupational class	vacancy rate %	hard-to-fill vacancies %
	Educational occupations		
0131	Primary and special education teachers	x	x
0132	Secondary and tertiary education teachers	x	x
0133	School principals and other higher educational professions	x	x
	Cultural occupations		
1131	Translators and other literary professions	-	-
1231	Pastoral vocations	1	-
1331	Visual and performing artists	-	-
	Technical and industrial occupations		
3031	Scientific researchers and engineering specialists	1	17
3631	Higher mechanical engineers	2	33
3731	Higher electrical engineers	1	50
3931	Architects, civil engineers and city planners	1	50
	Medical and paramedical occupations		
5031	Physiotherapists and occupational therapists	1	33
5032	Radiological, medical and biological laboratory professionals	1	-
5033	Physicians, medical specialists, pharmacists	1	100
5035	Dentists and dental specialists	2	100
	Commercial and administrative occupations		
6031	Senior finance and sales managers	1	29
6131	System analysts, programmers and system supervisors	1	42
6132	Accountants and economists	1	29
6331	Senior civil servants	x	x
6332	Legal professionals	1	-
	Socio-cultural occupations		
7031	Librarians, archivists and curators	1	-
7032	Personnel officers, vocational advisors and employment agents	1	-
7033	Community workers and probation officers	2	22
7034	Social scientists	1	-
7035	Information service and media specialists	1	-

x = no information available - = nil
* Excluding vacancies in government service, sheltered workshops, and temporary employment bureaus

Source: CBS vacancy survey/ROA

The vacancy rates for the occupational classes of 'Higher mechanical engineers', 'Dentists and dental specialists' and 'Community workers and probation officers' are relatively high. It is also striking that vacancies for the occupational classes of 'Physicians, medical specialists and pharmacists' and 'Dentists and dental specialists' are hard-to-fill, which is an indication of the recruitment problems which are at present being encountered within the higher medical occupations as regards salaried functions. For the occupational classes 'Higher electrical engineers' and 'Architects, civil engineers and city planners' it can be seen that half of the vacancies are hard-to-fill.

Future market position

The expected number of job openings is the key element in the future market position of the higher occupations. The other element, the supply of new entrants, can generally not be unambiguously traced to particular occupations, so that it is not possible to match demand and supply for each occupational class. Table 4.3 presents the total demand for new entrants for the forecast period 1993-1998 for the higher occupations.[25] The table shows the total number of expected job openings, along with the average annual demand, expressed as a percentage of the number of people working in that occupational class. The expected number of job openings is also characterized in qualitative terms according to the degree to which the expected number of job openings differs from the overall picture. The table also shows the occupational classes for which at least half of the expected job openings derive from the expected expansion demand.

It can be seen from table 4.3 that in the coming five years a relatively large number of job openings are expected for the cultural, technical and medical and paramedical occupations (except for 'Radiological, medical and biological laboratory professionals'), in particular. For four occupational classes large numbers of job openings, in both absolute and relative terms, are expected: 'Visual and performing artists', 'Scientific researchers and engineering specialists', 'Physiotherapists and occupational therapists' and 'Physicians, medical specialists and pharmacists'. For the latter two occupational classes this is mainly the result of the relatively favourable trend in employment levels.

In contrast, the expected number of job openings for the occupational classes of 'Senior civil servants' and 'Secondary and tertiary education teachers' is relatively low. The average annual demand for new entrants to these occupational classes is less than 4%. As a result of relatively low replacement demand, the occupational classes 'Accountants and economists' and 'Community workers and probation officers' are also expected to face relatively low numbers of job openings. It must however be said that the numbers of job openings for the occupational classes of 'Secondary and tertiary education teachers' and 'Community workers and probation officers' in the period 1993-1998 are nevertheless, in absolute terms, quite large. With the exception of the 'System analysts, programmers, and system supervisors', 'Personnel officers, vocational advisors and employment agents' and 'Information service and media specialists' the expected number of job openings for the higher occupations is determined mainly by the replacement demand. For the 'Senior finance and sales managers' and 'Legal professionals' however, almost half of the expected job openings are due to expansion demand.

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25. As has been noted in chapter 3, the total flow of vacancies will by definition be larger than the number of job openings, because inter-job mobility within an occupational class creates new vacancies but no job openings for new entrants.

Table 4.3. Expected numbers of job openings in the higher occupations, 1993-1998 (total numbers and average annual rates)[a]

ROA code	occupational class	number	%	character-ization
	Educational occupations			
0131	Primary and special education teachers	17,500	3.5	average
0132	Secondary and tertiary education teachers	24,900	3.2	low
0133	School principals and other higher educational professions	8,400	4.0	average
	Cultural occupations			
1131	Translators and other literary professions	1,400	4.9	high
1231	Pastoral vocations	2,100	5.5	high
1331	Visual and performing artists	10,600	5.8	very high
	Technical and industrial occupations			
3031	Scientific researchers and engineering specialists	15,400	5.1	high
3631	Higher mechanical engineers	4,200	5.2	high
3731	Higher electrical engineers	6,200	5.2	high
3931	Architects, civil engineers and city planners	9,000	5.1	high
	Medical and paramedical occupations			
5031	Physiotherapists and occupational therapists	16,500	6.8	very high
5032	Radiological, medical and biological laboratory professionals	5,700	3.5	average
5033	Physicians, medical specialists, pharmacists	12,200	5.4	high
5035	Dentists and dental specialists	2,100	5.9	very high
	Commercial and administrative occupations			
6031	Senior finance and sales managers	29,100	4.4	average
6131	System analysts, programmers and system supervisors	31,300	4.2	average
6132	Accountants and economists	9,000	3.0	low
6331	Senior civil servants	6,400	3.4	low
6332	Legal professionals	6,700	3.8	average
	Socio-cultural occupations			
7031	Librarians, archivists and curators	4,700	5.4	high
7032	Personnel officers, vocational advisors and employment agents	7,600	4.8	high*
7033	Community workers and probation officers	9,600	2.8	low
7034	Social scientists	4,700	3.9	average
7035	Information service and media specialists	4,400	4.9	high*

[a] The occupation classes marked with a * are those for which more than half of the expected number of job openings arise because of expansion demand

Source: ROA

Risk position

Because of the relatively long course of study which is required, the percentage of young people in higher occupations is quite low in comparison with other occupations. Because of the increasing tendency for students to continue their initial education to higher educational levels, the expected fall in the proportion of young people in the working population will probably not affect the supply of new entrants for the higher occupations to any great degree.

Table 4.4. Percentages of workers in the higher occupations aged 50 and older, averages 1988-1992

ROA code	occupational class	%
	Educational occupations	
0131	Primary and special education teachers	9
0132	Secondary and tertiary education teachers	17
0133	School principals and other higher educational professions	21
	Cultural occupations	
1131	Translators and other literary professions	-
1231	Pastoral vocations	44
1331	Visual and performing artists	16
	Technical and industrial occupations	
3031	Scientific researchers and engineering specialists	15
3631	Higher mechanical engineers	17
3731	Higher electrical engineers	17
3931	Architects, civil engineers and city planners	21
	Medical and paramedical occupations	
5031	Physiotherapists and occupational therapists	7
5032	Radiological, medical and biological laboratory professionals	8
5033	Physicians, medical specialists, pharmacists	14
5035	Dentists and dental specialists	-
	Commercial and administrative occupations	
6031	Senior finance and sales managers	19
6131	System analysts, programmers and system supervisors	5
6132	Accountants and economists	15
6331	Senior civil servants	22
6332	Legal professionals	11
	Socio-cultural occupations	
7031	Librarians, archivists and curators	18
7032	Personnel officers, vocational advisors and employment agents	10
7033	Community workers and probation officers	10
7034	Social scientists	9
7035	Information service and media specialists	12

- = no information available

Source: CBS/ROA

Another risk relating to the age structure of the workforce is the possible increase in the proportion of those already working who are in the older age-groups. For employers this involves the danger of educational obsolescence. Considering the enormous growth of higher education in the 70s and 80s, in general no problems would be expected in the near future in this regard. Table 4.4 shows that this is indeed so. The occupational class of 'Pastoral vocations' has the highest percentage of workers aged 50 years or more. In addition, as might be expected, the percentage of older people is relatively high in occupational classes requiring leadership and management qualities, such as 'School principals and other higher educational professions' and 'Senior civil servants'. The very low percentage of those working in the

occupational class of 'System analysts, programmers, and system supervisors', a comparatively new occupational class which has grown very rapidly in recent decades, is hardly surprising. Among the medical professions, the percentage of older people in the occupational classes of 'Physiotherapists and occupational therapists' and 'Radiological, medical and biological laboratory professionals' is comparatively low. This is also true for the occupational classes of 'Primary and special education teachers' and 'Social scientists'.

Table 4.5. Higher occupations' sensitivity to cyclical fluctuations

ROA code	occupational class	sensitivity indicator	qualification
	Educational occupations		
0131	Primary and special education teachers	1.01	small
0132	Secondary and tertiary education teachers	1.04	small
0133	School principals and other higher educational professions	1.15	small
	Cultural occupations		
1131	Translators and other literary professions	1.40	small
1231	Pastoral vocations	1.51	average
1331	Visual and performing artists	1.53	average
	Technical and industrial occupations		
3031	Scientific researchers and engineering specialists	1.66	average
3631	Higher mechanical engineers	2.14	average
3731	Higher electrical engineers	2.40	large
3931	Architects, civil engineers and city planners	1.49	average
	Medical and paramedical occupations		
5031	Physiotherapists and occupational therapists	1.62	average
5032	Radiological, medical and biological laboratory professionals	1.60	average
5033	Physicians, medical specialists, pharmacists	1.62	average
5035	Dentists and dental specialists	1.69	average
	Commercial and administrative occupations		
6031	Senior finance and sales managers	1.69	average
6131	System analysts, programmers and system supervisors	1.61	average
6132	Accountants and economists	1.45	small
6331	Senior civil servants	1.08	small
6332	Legal professionals	1.19	small
	Socio-cultural occupations		
7031	Librarians, archivists and curators	1.45	small
7032	Personnel officers, vocational advisors and employment agents	1.36	small
7033	Community workers and probation officers	1.43	small
7034	Social scientists	1.40	small
7035	Information service and media specialists	1.27	small

Source: ROA

The second indicator which gives an idea of the risk position of the higher occupations is the sensitivity of employment to fluctuations in the business cycle. Table 4.5 shows that in many higher occupations the employment situation is only slightly affected by economic fluctuations.

This means that the risk position of many higher occupations in this regard, for both those offering labour and those seeking workers, is favourable. Only one higher occupational class, the 'Higher electrical engineers', is characterized by the high sensitivity of its employment to these fluctuations.

Table 4.6. Higher occupations' opportunities of switching to other economic sectors, averages for 1988-1992

ROA code	occupational class	dispersion index	qualification
	Educational occupations		
0131	Primary and special education teachers	0.13	very small
0132	Secondary and tertiary education teachers	0.12	very small
0133	School principals and other higher educational professions	0.73	average
	Cultural occupations		
1131	Translators and other literary professions	0.73	average
1231	Pastoral vocations	0.32	small
1331	Visual and performing artists	0.30	very small
	Technical and industrial occupations		
3031	Scientific researchers and engineering specialists	0.91	large
3631	Higher mechanical engineers	0.89	large
3731	Higher electrical engineers	0.82	large
3931	Architects, civil engineers and city planners	0.71	average
	Medical and paramedical occupations		
5031	Physiotherapists and occupational therapists	0.32	small
5032	Radiological, medical and biological laboratory professionals	0.51	average
5033	Physicians, medical specialists, pharmacists	0.33	small
5035	Dentists and dental specialists	0.07	very small
	Commercial and administrative occupations		
6031	Senior finance and sales managers	0.97	very large
6131	System analysts, programmers and system supervisors	0.89	large
6132	Accountants and economists	0.79	average
6331	Senior civil servants	0.32	small
6332	Legal professionals	0.70	average
	Socio-cultural occupations		
7031	Librarians, archivists and curators	0.78	average
7032	Personnel officers, vocational advisors and employment agents	0.83	large
7033	Community workers and probation officers	0.73	average
7034	Social scientists	0.81	large
7035	Information service and media specialists	0.86	large

Source: ROA

The third indicator of the risk position of the higher occupations relates to the opportunities to switch to other economic sectors. This indicator shows the extent to which those offering their labour are dependent on changes in the labour market in particular sectors. The results for the higher occupations are given in table 4.6. For the higher technical occupations the opportunities of switching within the labour market are relatively good, with the exception of the 'Architects,

civil engineers and city planners'. Within the commercial and administrative segment, there are two occupational classes which have many options for switching to other economic sectors: 'Senior finance and sales managers' and 'System analysts, programmers, and system supervisors'. Of the socio-cultural occupations, the occupational classes of 'Personnel officers, vocational advisors and employment agents', 'Social scientists' and 'Information service and media specialists' have relatively many opportunities to switch to other segments of the labour market. In contrast, the labour market flexibility of the medical occupations, with the exception of the 'Radiological, medical and biological laboratory professionals' is comparatively low. The two largest occupational classes in the educational sphere are characterized by having relatively few options outside the education system. Those working in the occupational classes of 'Pastoral vocations', 'Visual and performing artists' and 'Senior civil servants' also have few possibilities beyond their own segments of the labour market.

Summary

The current market position of the higher occupations is in general characterized by fairly low vacancy rates, although there are expected to be relatively large numbers of job openings in the near future. In this respect the relatively large numbers of job openings for the period 1993-1998 in the occupational classes of 'Physicians, medical specialists and pharmacists' and 'Dentists and dental specialists' are striking, especially as the vacancies for these occupational classes which are open at present are already hard-to-fill, and the flows of new entrants will be relatively limited (see section 4.3.).

As regards the risk position we can conclude that, for the higher occupations in the medium term, there is as yet no clear trend to an increased proportion of older workers, and that the employment situation is only subject to economic fluctuations to a limited degree. The only exception as regards the last point is the occupational class of 'Higher electrical engineers'. The higher technical and socio-cultural occupations are generally characterized by great labour market flexibility, whereas the higher educational and medical and paramedical occupations offer few opportunities of switching to other segments of the labour market.

4.3. The market position of higher education

Market share

Table 4.7 shows the number of workers with higher education, as percentages of the total number of people working, for the period 1990-1992. This gives an indication of the importance of these types of education in the total employment picture. About 22% of all those working have completed a course at Higher Vocational Education or university level. This differs by 4 percentage points from the share of the higher occupations in total employment which was presented in section 4.2. The difference does not automatically mean that this component of the workforce with higher education represents workers whose qualifications are under-utilized, since there may also be people with lower or intermediate level education who hold positions at the Higher Vocational Education or university level.

Of the 22% with higher education, about 15 percentage points represent those who have completed a course at Higher Vocational Education level, and around 7 percentage points refer to those with University Education. If we consider only higher education, the Vocational Education course 'Teacher Training' is the type of education which has produced the largest number of those working now. More than 4% of the workforce have completed such a course. Second in terms of size is 'Higher Vocational Education, Commerce and Administration', with an employment share of 3% of the total workforce. The Higher Vocational Education courses in 'Engineering' and 'Social and Cultural' fields each account for around 2% of the total workforce. The largest number of those already working with a university education have a social science background. These amount to something over 1% of the total workforce. Almost 1% of the total number of those working have completed an engineering course at University level. The same goes for the University education in 'Economics, Econometrics, and Business Administration' and 'Law and Public Administration'.

Table 4.7. Workers with higher education, in absolute numbers and as a percentage of the total numbers employed, 1990-1992

Type of education	number	%
HVE Teacher Training	243,000	4.2
HVE Interpreter and Translator	6,000	0.1
HVE Agriculture	16,000	0.3
HVE Non-medical Laboratory	29,000	0.5
HVE Engineering	118,000	2.0
HVE Transport and Harbour	26,000	0.4
HVE Medical Laboratory	19,000	0.3
HVE Nursing and Paramedical Services	78,000	1.3
HVE Commerce and Administration	172,000	3.0
HVE Business Administration Technology	11,000	0.2
HVE Administrative, Legal and Fiscal	20,000	0.3
HVE Social and Cultural	104,000	1.8
HVE Fine Arts	34,000	0.6
HVE Police, Fire and Defense Forces	10,000	0.2
UE Teacher training	19,000	0.3
UE Arts	36,000	0.6
UE Theology	7,000	0.1
UE Agriculture	10,000	0.2
UE Mathematics and Natural Sciences	39,000	0.7
UE Engineering	55,000	0.9
UE Veterinary and Medical Sciences	48,000	0.8
UE Medical Laboratory	5,000	0.1
UE Economics, Econometrics and Business Administration	50,000	0.9
UE Law and Public Administration	50,000	0.9
UE Social Sciences	74,000	1.3
UE Fine Arts	5,000	0.1
Total	1,285,000	22.2

Source: CBS/ROA

Future market position

Table 4.8 sketches a picture of future labour market prospects for the types of education offered in higher education. This characterization has been created by bringing together the expected changes in the demand and supply of labour regarding new entrants. This gives an idea of the expected relative degrees of scarcity in the labour market in the coming five years for each type of education.

Bad labour market prospects are expected for three types of education: the University courses in 'Arts', 'Agriculture' and 'Fine Arts'. The bad prospects facing these three types of education relate mainly to the expected large flows of new entrants onto the labour market. The Agricultural and Fine Arts courses at Higher Vocational Education level and 'Higher Vocational Education, Business Administration Technology' are characterized by moderate prospects. The same goes for University Education in 'Law and Public Administration' and in 'Social Sciences'.

Table 4.8. Expected labour market prospects for the types of education in higher education, 1993-1998

Type of education	indicator future labour market prospects	qualification
HVE Teacher Training	0.97	reasonable
HVE Interpreter and Translator	0.99	reasonable
HVE Agriculture	1.09	moderate
HVE Non-medical Laboratory	0.96	good
HVE Engineering	0.96	good
HVE Transport and Harbour	0.81	good
HVE Medical Laboratory	0.87	good
HVE Nursing and Paramedical Services	0.99	reasonable
HVE Commerce and Administration	0.98	reasonable
HVE Business Administration Technology	1.09	moderate
HVE Administrative, Legal and Fiscal	0.98	reasonable
HVE Social and Cultural	1.00	reasonable
HVE Fine Arts	1,04	moderate
HVE Police, Fire and Defense Forces	1.00	reasonable
UE Teacher Training	1.00	reasonable
UE Arts	1.11	poor
UE Theology	0.82	good
UE Agriculture	1.19	poor
UE Mathematics and Natural Sciences	0.95	good
UE Engineering	0.99	reasonable
UE Veterinary and Medical Sciences	0.87	good
UE Medical Laboratory	0.92	good
UE Economics, Econometrics and Business Administration	0.99	reasonable
UE Law and Public Administration	1.06	moderate
UE Social Sciences	1.08	moderate
UE Fine Arts	1.32	poor

Source: ROA

For engineering courses at both Higher Vocational Education and University Education levels the labour market prospects are expected to be reasonable to good. This is chiefly due to the

relatively large number of job openings which are expected to emerge in the period 1993-1998. A favourable labour market situation is also expected for the medical types of education at university level for the coming years. This is largely the result of the relatively low flows of new entrants to the labour market. In section 4.2 it has already been noted that quite a large number of vacancies for medical occupations are at present hard to fill. The commercial and economic types of education are marked by reasonable labour market prospects. For 'University Education, Economics, Econometrics, and Business Administration' the favourable developments in employment level which are expected must be weighed against relatively large flows of new entrants to the labour market. Our expectation is that the labour market prospects for 'University Education, Theology' will be good. This results, on the one hand, from the large number of job openings and, on the other hand, from the low flows of new entrants.

Risk position

Table 4.9. Opportunities of switching to other occupations at a corresponding or higher level for the types of education falling under higher education, averages for 1990-1992

Type of education	dispersion index	qualification
HVE Teacher Training	0.82	average
HVE Interpreter and Translator	0.88	average
HVE Agriculture	0.95	large
HVE Non-medical Laboratory	0.83	average
HVE Engineering	0.96	large
HVE Transport and Harbour	0.95	large
HVE Medical Laboratory	0.71	small
HVE Nursing and Paramedical Services	0.76	small
HVE Commerce and Administration	0.93	large
HVE Business Administration Technology	0.93	large
HVE Administrative, Legal and Fiscal	0.90	average
HVE Social and Cultural	0.84	average
HVE Fine Arts	0.87	average
HVE Police, Fire and Defense Forces	0.84	average
UE Teacher Training	0.73	small
UE Arts	0.75	small
UE Theology	0.59	very small
UE Agriculture	0.94	large
UE Mathematics and Natural Sciences	0.90	average
UE Engineering	0.96	large
UE Veterinary and Medical Sciences and Dentistry	0.51	very small
UE Medical Laboratory	0.62	very small
UE Economics, Econometrics and Business Administration	0.90	average
UE Law and Public Administration	0.84	average
UE Social Sciences	0.90	average
UE Fine Arts	0.88	average

Source: ROA

In determining the risk position of the various types of education, the main factor is the potential flexibility of workers with a particular educational background. This is a question of

the degree to which the choice of a course of study also determines a specific occupational choice and thus a specific career. Table 4.9 provides an overview of the options open to graduates from each of the types of education in higher education to switch to various occupational groups at a similar or higher function level.

Workers educated to the Higher Vocational level in the 'Medical Laboratory' or 'Nursing and Paramedical Services' fields have only limited opportunities of switching to other occupations at a corresponding or higher function level. At University Education level the same picture emerges for courses in 'Veterinary and Medical Sciences and Dentistry' and 'Pharmacy', and the switching options are also relatively small for courses in 'Education', 'Arts' and 'Theology'. In contrast, the switching opportunities for those with agricultural and engineering education at Higher Vocational Education or university levels are relatively good, with the exception of those with qualifications from 'Higher Vocational Education, Non-medical Laboratory' and 'University Education, Mathematics and Natural Sciences'. At Higher Vocational Education level it is also striking that 'Commerce and Administration' and 'Business Administration Technology' are characterized by a relatively high flexibility potential.

Summary

There can be no overall answer to the question of how much of the increasing supply of graduates from higher education will be able to be absorbed by the labour market in the period 1993-1998. The problem must be considered separately for each of the various types of education which it is possible to differentiate. On balance, absorption problems are expected, in greater or lesser degree, for only eight of the 26 types of education which we have differentiated. For the other types of education, the expected labour market prospects are reasonable to good.

Good labour market prospects are in general expected for the coming five years for engineering courses at Higher Vocational and University Education level. For 'University Education, Engineering' the future labour market prospects could be said to be 'reasonable'. The higher types of engineering education also have relatively many options for switching to other occupations. All in all, therefore, the market position of the engineering courses could be termed 'good'.

The Higher Vocational Education courses in 'Medical Laboratory' and 'Nursing and Paramedical Services', and the University courses in 'Veterinary and Medical Sciences and Dentistry' and 'Pharmacy' are characterized by relatively few opportunities to switch to other occupations at a function level that corresponds to the level of the education. This indicates that workers who have a background in medical education at Higher Vocational Education or University level usually end up in specific professional sub-markets, so that there is a close relation between the education undertaken and the profession which is later practised. The same situation occurs for University Education in 'Education' and 'Theology'. For all these types of education, the labour market prospects for the near future are reasonable to good, although it is true that the choice

of these types of education entails the risk of great vulnerability to any sudden worsening of the labour market prospects within the specific field for which one has trained.

In contrast, for the types of education which fall under higher agricultural, higher socio-cultural, or Fine Arts education, the labour market prospects are expected to be moderate to bad, with the exception of 'Higher Vocational Education, Social and Cultural', for which the labour market prospects are reasonable. However for the agricultural types of education at Higher Vocational Education or University level, the possibilities of switching to other occupations at a job level which corresponds to the education are good, which may offer some consolation to those looking for work.

For the types of education which fall under higher economic education (including commerce and administration) and for 'Higher Vocational Education, Administrative, Legal and Fiscal', the future labour market prospects are reasonable. 'Higher Vocational Education, Commerce and Administration' is, moreover, characterized by a broad spread over various occupational groups, which means that its graduates do not find themselves in a confined professional sub-market. The options of switching to other occupations from economics courses at University level have been characterized as average. Finally, for 'Higher Vocational Education, Business Administration Technology' and 'University education, Law and Public Administration' the labour market prospects are expected to be moderate. For the first of these, however, the opportunities within the labour market to switch to other occupations are relatively good.

4.4. The market position of recent graduates from Higher Vocational Education

Information on the match between initial education and the first destination of recent graduates as they enter the labour market is very important for getting a better idea of the direct match between initial education and the labour market for those with higher education. In fact, the first destination of recent graduates can also to a large extent determine further career possibilities. In this section, on the basis of data from the *Higher Vocational Education Monitor* of 1992, a picture of the labour market position of those who graduated from *full-time* Higher Vocational Education in the 1990/1991 study year will be sketched. In doing so we can use a large number of indicators as regards their current market position and risk position. The *Higher Vocational Education Monitor* also offers the possibility of sub-dividing a number of ROA's 'types of education' within Higher Vocational Education, so that data can be presented for a total of 27 diverse *disciplines*.[26] The information will in each case also be given at the level of the 11 ROA educational categories, so that it is possible to make valid comparisons with the market position of Higher Vocational Education, as outlined in the previous section.

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26. Since the ROA Information System for Education and the Labour Market is based on the CBS educational categories, which are related to the International Standard Classification of Education (ISCED), a number of disciplines in Higher Vocational Education are included under a type of education which does not entirely accord with the sectors into which Higher Vocational Education is divided.

Current market position

Table 4.10. Unemployment among recent graduates from Higher Vocational Education, per type of education or discipline, 1992

Type of education or discipline	%
Teacher Training	16
Primary and special education	11
Secondary education	28
Non-medical Laboratory	10
Engineering	14
Electrical Engineering	20
Mechanical Engineering	11
Civil Engineering	10
Architecture and Quantity Surveying	11
Medical Laboratory	5
Nursing and Paramedical Services	9
Nursing	3
Nutrition	5
Ergotherapy	4
Physiotherapy	18
Speech Therapy	14
Creative therapy[a]	23
Commerce and Administration	9
Business Economics	7
Information Science	13
Economics and Marketing	9
International Economics	11
Accountancy	4
Business Administration Technology	11
Administrative, Legal and Fiscal	6
Social and Cultural	13
Personnel Management	9
Community, Welfare, and Residential Institution Work	16
Journalism, Librarianship and Documentation[a]	9
Hotel and Catering	6
Fine Arts	28
Total	12

[a] In the CBS classification these disciplines are included under these types of education.

Source: Higher Vocational Education Monitor 1992/ROA

On the basis of the *Higher Vocational Education Monitor*, an unemployment rate for recent graduates can be determined, so that a picture of the quantitative match between demand and supply in the labour market can be outlined. From table 4.10 it is clear that at the end of 1992 the unemployment rate among recent graduates from Higher Vocational Education was 12%. This is higher than the unemployment rate for all graduates from Higher Vocational Education,

which indicates that unemployment problems are significantly more serious among the recent graduates, who still have to establish their position on the labour market. Unemployment rates for those with 'Teacher Training' and 'Fine Arts' education are relatively high.[27] For 'Teacher Training' this is caused chiefly by the high unemployment rate among those with a teaching qualification for secondary education.

It is striking that there is a high unemployment rate for 'Engineering'. In particular, for the discipline of 'Electrical Engineering' and to a lesser degree also for 'Mechanical Engineering', the number of graduates who still have no work more than a year after completing their education is quite large. This may be due to the current economic recession. As was noted in section 4.2, employment for the occupational class of 'Higher electrical engineers' is in any case very sensitive to changes in the business cycle.

Of the recent graduates from 'Higher Vocational Education, Administrative, Legal and Fiscal' and 'Social and Cultural', 11% and 13%, respectively, are unemployed. For the latter type of education the unemployment among recent graduates is relatively high especially in the discipline of 'Community, Welfare, and Residential Institution Work'. For the types of education 'Medical laboratory', 'Administrative, Legal and Fiscal' and 'Hotel and catering', in contrast, the unemployment rate is relatively low. There are large differences between the unemployment levels for the various disciplines within the types of education 'Nursing and Paramedical Services' and 'Commerce and Administration'. For the former, unemployment for the disciplines of 'Nursing', 'Nutrition' and 'Ergotherapy' is low, while 'Creative Therapy', 'Physiotherapy' and 'Speech Therapy' have unfavourable positions. Within 'Commerce and Administration', the discipline of 'Accountancy' has a relatively low unemployment rate. In contrast, the percentage of graduates from the discipline of 'Information Science' who are unemployed is relatively high.

It is possible to form a picture of qualitative matching problems for new entrants to the labour market, to supplement the quantitative aspects of the match between demand and supply. As noted already, one key measure as regards qualitative problems is the percentage of workers whose qualifications are under-utilized. It should be borne in mind that the figures here refer to graduates' first jobs when they begin work, and that, especially where there is a firm-internal labour market, there may well be opportunities for them to gain promotion to a level that better corresponds to the education they have followed (see De Grip, Heijke and Willems, 1992).

Table 4.11 presents a picture of the degree to which the qualifications of recent graduates are under-utilized. The figures here are not based, as in chapter 3, on a long-established and probably outdated classification of the job levels of the occupational groups. Instead we have taken the minimum required education level of the job which each worker is in fact filling. The use of this data from the *Higher Vocational Education Monitor* has the advantage that it is

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27. In this section all references are to types of education within Higher Vocational Education. No reference is made to parallel courses in University Education, such as 'University Education, Teacher Training' or 'University Education, Fine Arts'.

possible to make allowance for variations in the function level within a given occupational group.

Table 4.11. Rate of under-utilization for recent graduates from Higher Vocational Education per education type or discipline 1992

Type of education or discipline	%
Teacher Training	14
Primary and special education	9
Secondary education	26
Non-medical Laboratory	8
Engineering	13
Electrical Engineering	14
Mechanical Engineering	13
Civil Engineering	10
Architecture and Quantity Surveying	17
Medical Laboratory	19
Nursing and Paramedical Services	21
Nursing	31
Nutrition	35
Ergotherapy	9
Physiotherapy	3
Speech Therapy	6
Creative therapy[a]	36
Commerce and Administration	19
Business Economics	13
Information Science	8
Economics and Marketing	23
International Economics	36
Accountancy	3
Business Administration Technology	12
Administrative, Legal and Fiscal	21
Social and Cultural	40
Personnel Management	14
Community, Welfare, and Residential Institution Work	52
Journalism, Librarianship and Documentation[a]	17
Hotel and Catering	22
Fine Arts	19
Total	20

[a] In the CBS classification these disciplines are included under these types of education.

Source: Higher Vocational Education Monitor 1992/ROA

The average under-utilization (or over-education) rate for all recent graduates from Higher Vocational Education is 20%. 'Social and Cultural' education stands out with a relatively high degree of under-utilization, caused by the large number of graduates from the discipline of 'Community, Welfare, and Residential Institution Work' who are working at a level below that

of their education. These graduates are mainly employed in residential institutions, in jobs which are open to people with both Higher and Intermediate Vocational Education. For the types of education 'Non-medical Laboratory' and 'Engineering' there is relatively little under-utilization, as also for 'Teacher Training' and 'Business Administration Technology'. For 'Teacher Training' this is because of the low rate of under-utilization for those with qualifications in 'Primary and special education'. In contrast, many graduates with a teaching certificate for secondary education are apparently employed somewhat below their level.

It is also striking that the types of education 'Nursing and Paramedical Services' and 'Commerce and Administration' are characterized by large differences in the degrees of under-utilization which are found in their component disciplines. Within 'Nursing and Paramedical Services', graduates from 'Nursing', 'Nutrition' and 'Creative Therapy' suffer high rates of under-utilization, while only a limited number of graduates who have studied 'Ergotherapy', 'Physiotherapy' and 'Speech Therapy' work below the Higher Vocational Educational level. The disciplines of 'Business Economics', 'Information Science' and, especially, 'Accountancy' within 'Higher Vocational Education, Commerce and Administration' also face only a low degree of under-utilization. In contrast, the number of graduates who have studied 'International Economics' and whose qualifications are under-utilized is relatively high.

In addition to working at too low a level, taking up a function in another field can also be an indicator of a bad current market position. Those who are working at too low a level are not considered here. With the aid of this indicator a picture can at the same time be formed of the degree to which recent graduates end up in sharply defined occupational fields, the so-called 'professional sub-markets', or on the other hand are employed in broadly accessible segments of the labour market, in which they face a lot of competition from graduates with other educational backgrounds. In the latter case this can also indicate the existence of opportunities of switching to other occupational fields, which strengthens the market position of education in that field (see also figure 4.2).

Table 4.12 gives an overview of the disciplines in which qualifications are required for the functions in which the recent graduates from the various types of education and disciplines in Higher Vocational Education which we have distinguished are now working. About one year after graduation, 90% of the graduates were employed in an occupation for which education in the disciplines in which they graduated or a related discipline is a prerequisite. The types of education 'Non-medical Laboratory', 'Medical Laboratory' and 'Medical and Paramedical', with the exception of the discipline of 'Creative Therapy', are notable for the high percentage of their graduates who are employed in a job for which education in the discipline in which they graduated, or a related discipline, is required. For 'Teacher Training', especially for 'Primary and special education', the course which workers have in fact followed, or a related discipline, is also often a prerequisite for the post they hold. Graduates who have studied for a teaching qualification for 'Secondary Education' are, in comparison, somewhat more likely to be employed in jobs for which the normal requirement is a qualification in a discipline other than that which they in fact studied.

Table 4.12. Qualifications required for the jobs in which recent graduates from Higher Vocational Education are employed, per type of education or discipline, 1992

Type of education or discipline	own or related discipline %	other discipline %	no fixed discipline %
Teacher Training	95	2	3
Primary and special education	98	1	1
Secondary education	89	6	5
Non-medical Laboratory	97	1	3
Engineering	92	1	6
Electrical Engineering	94	1	5
Mechanical Engineering	91	2	7
Civil Engineering	98	0	2
Architecture and Quantity Surveying	98	0	2
Medical Laboratory	98	0	2
Nursing and Paramedical Services	97	1	2
Nursing	97	1	2
Nutrition	97	0	3
Ergotherapy	100	0	0
Physiotherapy	98	1	1
Speech Therapy	96	3	1
Creative therapy[a]	88	7	5
Commerce and Administration	85	1	14
Business Economics	95	1	5
Information Science	90	0	10
Economics and Marketing	76	3	21
International Economics	62	2	36
Accountancy	100	0	0
Business Administration Technology	78	4	18
Administrative, Legal and Fiscal	77	5	17
Social and Cultural	91	3	7
Personnel Management	84	5	11
Community, Welfare, and Residential Institution Work	95	2	3
Journalism, Librarianship and Documentation[a]	87	1	12
Hotel and Catering	64	5	30
Fine Arts	86	5	9
Total	90	2	8

[a] In the CBS classification these disciplines are included under these types of education.

Source: Higher Vocational Education Monitor 1992/ROA

Within 'Higher Vocational Education, Engineering' it is striking that almost all the graduates from 'Civil Engineering' and 'Architecture and Quantity Surveying' are employed in an occupation that corresponds very closely to the discipline they have studied. This is also true, to a somewhat lesser degree, for the discipline of 'Community, Welfare, and Residential Institution Work', which falls within the 'Higher Vocational Education, Social and Cultural'.

Table 4.13. Average gross monthly income of recent graduates from Higher Vocational Education, per education type or discipline, 1992

Type of education or discipline	guilders
Teacher Training	2,644
Primary and special education	2,615
Secondary education	2,631
Non-medical laboratory	3,171
Engineering	3,363
Electrical Engineering	3,363
Mechanical Engineering	3,294
Civil Engineering	3,326
Architecture and Quantity Surveying	3,169
Medical Laboratory	2,936
Nursing and Paramedical Services	3,100
Nursing	3,030
Nutrition	2,790
Ergotherapy	2,975
Physiotherapy	3,618
Speech Therapy	2,876
Creative therapy[a]	2,285
Commerce and Administration	3,289
Business Economics	3,282
Information Science	3,547
Economics and Marketing	3,227
International Economics	3,090
Accountancy	3,853
Business Administration Technology	3,649
Administrative, Legal and Fiscal	3,261
Social and Cultural	2,844
Personnel Management	3,374
Community, Welfare, and Residential Institution Work	2,684
Journalism, Librarianship and Documentation[a]	3,017
Hotel and Catering	3,596
Fine Arts	3,042
Total	3,141

[a] In the CBS classification these disciplines are included under these types of education.

Source: Higher Vocational Education Monitor 1992/ROA

The graduates from 'Business Administration Technology', 'Administrative, Legal and Fiscal' and 'Hotel and Catering', in contrast, are more likely to end up in jobs for which no specific field of study is required. The same goes, although to a lesser degree, for 'Higher Vocational Education, Commerce and Administration'. Within this type of education there are however marked differences between the various fields of study. Graduates who have studied 'Business Economics' or 'Accountancy' are generally employed in fields corresponding to their education. In contrast, for graduates who have studied 'Economics and Marketing' and 'International

Economics' and have found work at the Higher Vocational Educational level, the disciplines which they have studied are clearly of less importance.

The income of recent graduates can help in forming a better idea of the position which a type of education or discipline offers on the labour market. A relatively high income can indicate a tight labour market, although existing institutional arrangements as regards wages can mask this relation. Table 4.13 gives an indication of the income position of graduates from Higher Vocational Education on the basis of the average gross monthly wage. It must be remembered in this respect that the monthly wage is closely related to the proportion of part-time work. It may well be that the reason recent graduates are more likely to accept a part-time job is more because there are not enough full-time jobs available than because they have a specific preference for working on a part-time basis.

Table 4.13 shows that the average gross monthly wage for recent graduates from Higher Vocational Education is more than 3,100 guilders, although the average for the types of education 'Business Administration Technology' and 'Hotel and Catering' is more than 300 guilders higher. 'Engineering' is also characterized by a relatively favourable income position, with electrical engineering graduates fairing best. Within 'Commerce and Administration', it is the graduates from the disciplines of 'Information Science' and 'Accountancy' who earn the most.

The graduates from the two disciplines which have been differentiated within 'Teacher Training' earn a relatively low average gross monthly wage, due in part to the fact that the average working week of these graduates is shorter. Graduates from the types of education 'Medical Laboratory' and 'Social and Cultural' also have a relatively unfavourable income status, although it must be noted, as regards the latter, that graduates who have studied 'Personnel Management' earn a relatively high average income, while those from 'Social, Welfare, and Residential Institution Work', in contrast, earn a low gross monthly wage.

Recent graduates from Higher Vocational Education in 'Nursing and Paramedical Services' earn, on average, somewhat less than the other graduates from Higher Vocational Education, but it is notable that the graduates from the discipline of 'Physiotherapy' earn a relatively high gross monthly wage. Graduates who have studied 'Creative Therapy', in contrast, earn a very low income in comparative terms. The disciplines of 'Nutrition' and 'Speech Therapy' are also characterized by relatively low average gross wages.

Another aspect of the market position of recent graduates is the opportunities open to them to set themselves up as freelancers or self-employed workers. Table 4.14 shows that almost a third of the graduates from 'Fine Arts' work as freelancers or are self-employed. There are four disciplines which are notable for the relatively large number of graduates who are self-employed or work as freelancers: 'Secondary Education (Teacher Training)', 'Speech Therapy', 'Physiotherapy' and 'Journalism, Librarianship and Documentation'. For the first of these areas, the self-employed are apparently mainly graduates with Teacher Training in 'Expressive Subjects' or 'Physical Education'.

Table 4.14. Percentages of recent graduates from Higher Vocational Education who are self-employed, by type of education or discipline, 1992

Type of education or discipline	%
Teacher Training	3
Primary and special education	0
Secondary education	8
Non-medical Laboratory	1
Engineering	2
Electrical Engineering	3
Mechanical Engineering	0
Civil Engineering	0
Architecture and Quantity Surveying	2
Medical Laboratory	0
Nursing and Paramedical Services	4
Nursing	1
Nutrition	0
Ergotherapy	0
Physiotherapy	8
Speech Therapy	18
Creative therapy[a]	2
Commerce and Administration	1
Business Economics	1
Information Science	2
Economics and Marketing	1
International Economics	3
Accountancy	0
Business Administration Technology	1
Administrative, Legal and Fiscal	1
Social and Cultural	4
Personnel Management	6
Community, Welfare, and Residential Institution Work	1
Journalism, Librarianship and Documentation[a]	14
Hotel and Catering	3
Fine Arts	32
Total	3

[a] In the CBS classification these disciplines are included under these types of education.

Source: Higher Vocational Education Monitor 1992/ROA

The nature of employment contracts can also give an indication of the current market position of new entrants to the labour market. When the economic climate is poor, new entrants are often forced to accept temporary contracts or jobs with a shorter working week. Table 4.15 provides an overview of the percentages of graduates with a permanent employment contract and the percentages who are employed for less than 30 hours per week.

Table 4.15. Type of employment contract for recent graduates from Higher Vocational Education, by type of education or discipline, 1992

Type of education or discipline	permanent contract %	less than 30 hours %
Teacher Training	52	24
Primary and special education	58	16
Secondary education	44	40
Non-medical Laboratory	58	1
Engineering	63	2
Electrical Engineering	67	2
Mechanical Engineering	60	2
Civil Engineering	69	0
Architecture and Quantity Surveying	69	2
Medical Laboratory	62	0
Nursing and Paramedical Services	74	19
Nursing	83	7
Nutrition	53	16
Ergotherapy	77	17
Physiotherapy	67	31
Speech Therapy	56	47
Creative therapy[a]	58	48
Commerce and Administration	69	2
Business Economics	71	0
Information Science	75	1
Economics and Marketing	67	3
International Economics	67	2
Accountancy	86	2
Business Administration Technology	69	2
Administrative, Legal and Fiscal	62	9
Social and Cultural	61	17
Personnel Management	59	8
Community, Welfare, and Residential Institution Work	64	18
Journalism, Librarianship and Documentation[a]	53	18
Hotel and Catering	69	2
Fine Arts	45	26
Total	65	11

[a] In the CBS classification these disciplines are included under these types of education.

Source: Higher Vocational Education Monitor 1992/ROA

A relatively large percentage of the graduates from 'Nursing and Paramedical Services' have a permanent contract, but there are large differences in this respect between the various disciplines which make up this type of education. For the disciplines of 'Nursing' and 'Ergotherapy', the percentage of graduates with a permanent job is relatively high, while a significantly lower number of graduates who studied 'Nutrition', 'Speech Therapy' and 'Creative Therapy' have a permanent job. The types of education 'Non-medical Laboratory' and 'Fine

Arts' are characterized by the comparatively low percentage of their graduates who have a permanent appointment. The same is true for the two disciplines which have been distinguished within 'Teacher Training'. It is also striking that graduates from the discipline of 'Mechanical Engineering' are less likely to have a permanent job. Within Commerce and Administration education at Higher Vocational Education level, the disciplines of 'Business Economics', 'Information Science' and 'Accountancy' have relatively favourable positions in this respect. The reverse applies to the disciplines of 'Personnel Management' and 'Journalism, Librarianship and Documentation'.

In general the engineering and commercial and administrative types of education at Higher Vocational Education level are characterized by the low percentage of their graduates who work for less than 30 hours per week. In contrast, a relatively large number of graduates from the medical and paramedical disciples work less than 30 hours per week. The percentage of graduates who have only a small part-time job is very high for the disciples of 'Creative Therapy', 'Speech Therapy' and 'Physiotherapy'. For 'Speech Therapy' this is apparently related to the high percentage of graduates who are self-employed. Many graduates from the various fields within socio-cultural education, with the exception of the discipline of 'Personnel Management', also work less than 30 hours per week. Very high percentages of part-time workers are also found among graduates from the types of education 'Teacher Training' and 'Fine Arts'. For example, some 40% of those with a Teaching Certificate for secondary education work less than 30 hours per week.

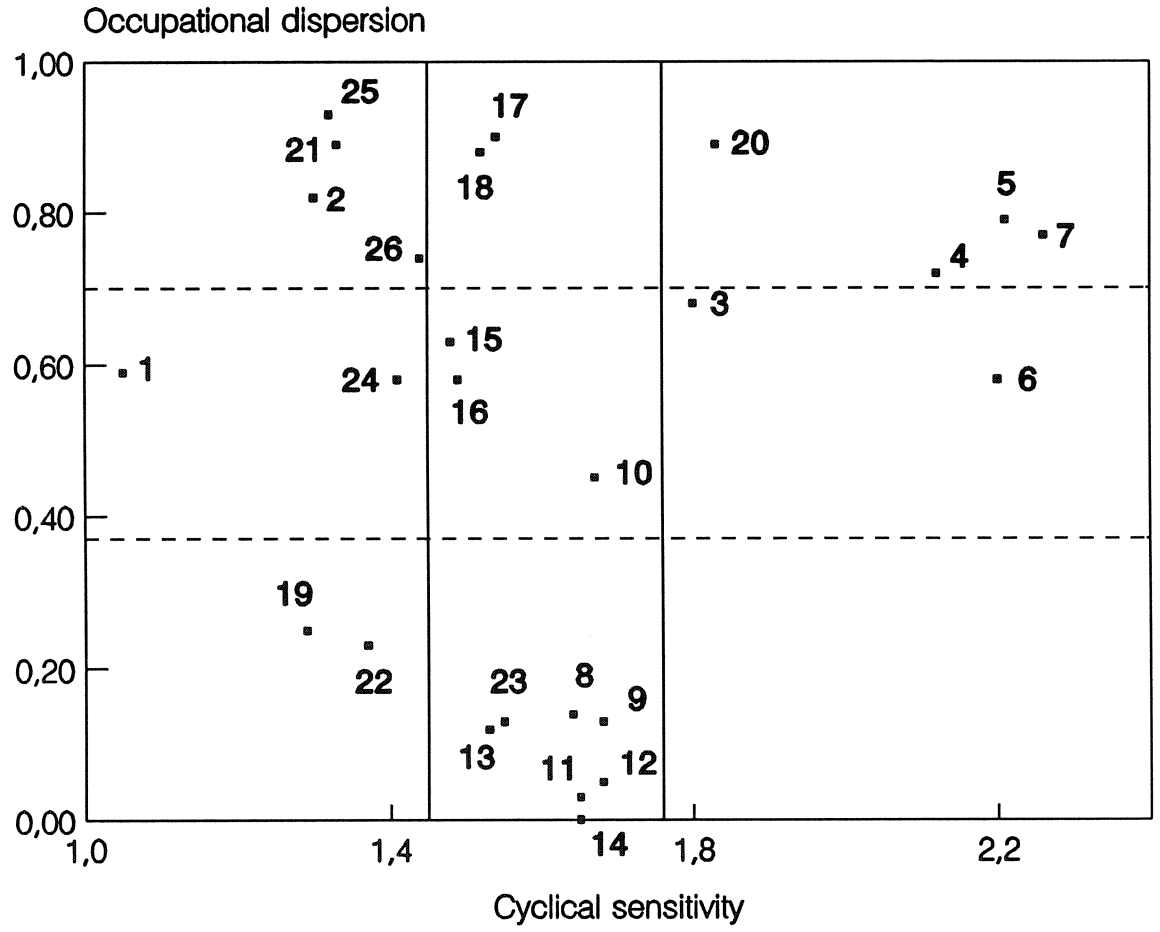
Risk position

To give some insight of the risks which recent graduates face in the labour market, the indicator for the sensitivity of employment to the state of the business cycle has been combined in figure 4.2 with the indicator for the occupational spread at a corresponding or higher function level. Both indicators have been sub-divided into low, average and high ranges, producing the nine areas of figure 4.2.

Where the occupational spread is high and the sensitivity of employment to fluctuations in the business cycle is low, the risk position is certainly favourable. In that case employment levels fluctuate little and labour market flexibility is good, because there are many options of switching to other occupations. In contrast, where employment levels are highly sensitive to cyclical fluctuations and the occupational spread is low, the risk position is bad: large fluctuations in employment levels and limited opportunities of finding a job in other occupations.

From figure 4.2 it can be seen that diverse types of education and disciplines within Higher Vocational Education offer a favourable risk position, including most disciplines within commercial and administrative education (with the exception of 'Accountancy'). For the various disciplines falling under the types of education 'Teacher Training', 'Administrative, Legal and Fiscal', 'Hotel and Catering' and 'Fine arts', and for graduates in the discipline of 'Journalism, librarianship and documentation' within 'Social and Cultural' education, the risk position could also be said to be good.

Figure 4.2. The risk position for recent graduates from Higher Vocational Education on the basis of sensitivity to business cycles and opportunities of switching to occupations at a matching or higher level



1 teacher training: primary and special education
2 teacher training: secondary education
3 non-medical laboratory
4 engineering: electrical engineering
5 engineering: mechanical engineering
6 engineering: civil engineering
7 engineering: architecture and quantity surveying
8 medical laboratory
9 nursing and paramedical services: nursing
10 nursing and paramedical services: nutrition
11 nursing and paramedical services: ergotherapy
12 nursing and paramedical services: physiotherapy
13 nursing and paramedical services: speech therapy
14 nursing and paramedical services: creative therapy
15 commercial and administrative: business economics
16 commercial and administrative: information science
17 commercial and administrative: economics and marketing
18 commercial and administrative: international economics
19 commercial and administrative: accountancy
20 business administration technology
21 administrative, legal and fiscal
22 social and cultural: personnel management
23 social and cultural: community, welfare and residential institution work
24 social and cultural: journalism, librarianship and documentation
25 hotel and catering
26 fine arts

Source: ROA

The disciplines falling under 'Nursing and Paramedical Services' and 'Medical Laboratory', in contrast, are characterized by limited options of switching to other occupations at a matching job level, while their sensitivity to business cycle fluctuations is average. One exception to this

is the discipline of 'Nutrition', whose graduates' labour market flexibility is average. The disciplines of 'Personnel Management' and 'Community, Welfare, and Residential Institution Work' face low or average sensitivity to cyclical fluctuations and have only limited opportunities of switching to other occupations. The cyclical sensitivity for the discipline of 'Accountancy' is not great, but if there were to be any worsening of the employment situation it is doubtful whether this could be compensated for by switching to other occupations. Engineering education at Higher Vocational Education level, and the type of education 'Business Administration Technology', in contrast, are characterized by relatively unstable employment levels. However, since the potential flexibility of these graduates is average to high, an unfavourable employment situation can in part be compensated for by switching to other occupations. It must however be remembered that, as noted earlier in this section, relatively many of those with engineering backgrounds are employed in a job for which the discipline they have studied, or a related discipline, is a prerequisite.

Summary

The current market position and the risk position of recent graduates from Higher Vocational Education can clarify the extent to which the labour market is at present able to absorb the higher flows of these graduates. It can however be seen that no general verdict can be given on this point for higher education, in view of the very diverse situations for the various disciplines.

In comparison with previous years, engineering education at Higher Vocational Education level is now facing higher unemployment. Unemployment among recent graduates is especially high for 'Electrical Engineering'. However this is offset by the fact that when graduates from 'Higher Vocational Education, Engineering' do obtain a job, it is usually a job which corresponds to their education in both level and discipline. These graduates also have a favourable position as regards income, especially the graduates from the discipline of 'Electrical Engineering'. This may indicate that the position of graduates in this field would improve rapidly if the economic situation improves. The majority of recent graduates from engineering education at Higher Vocational Education level have found a permanent full-time appointment within about a year after completing their education. As regards the risk position of these graduates, it is noticeable that employment levels are relatively unstable, but that there are opportunities enough for switching to other occupations at a matching or higher function level.

There are clear differences between the various disciplines within commercial and administrative education at Higher Vocational Education level, as regards the seriousness of unemployment among new graduates. Unemployment is relatively low for the disciplines of 'Business Economics' and 'Accountancy', while the discipline of 'Information Science', remarkably enough, has a higher unemployment rate. A clear division is evident as regards both the match between the discipline and level of graduates' education and the job they are performing, and the nature of their employment contracts. The disciplines of 'Business Economics', 'Information Science' and 'Accountancy' have favourable positions on all of these points, while the labour market position of graduates who have studied 'Economics and Marketing' and 'International Economics' is less favourable. The risk position of recent graduates from Commercial and

Administrative education at Higher Vocational Education level is in general quite favourable. The employment situation is reasonably stable and their labour market flexibility is high. One exception here is 'Accountancy': graduates from this discipline appear to find it more difficult to switch to other occupations if the employment situation in a particular occupational field deteriorates.

The disciplines of 'Physiotherapy', 'Speech Therapy' and 'Creative Therapy' are characterized by a high unemployment rate. Recent graduates from the first two disciplines who have found work have generally done so in a job corresponding to their level. In contrast, for 'Creative Therapy' both the quantitative and the qualitative match are bad. For the disciplines of 'Nursing', 'Nutrition' and 'Ergotherapy', the unemployment rate is relatively low, and for the latter group the degree of under-utilization is also relatively low. For 'Nursing' and 'Nutrition' under-utilization is relatively common. Recent graduates from 'Higher Vocational Education, Nursing and Paramedical Services' are generally employed in a job which corresponds closely to the disciplines in which they trained. As regards income, it is striking that the discipline of 'Nutrition', 'Speech Therapy' and 'Creative Therapy' occupy a less favourable position, while 'Physiotherapy' has a relatively favourable position. The disciplines of 'Creative Therapy', 'Speech Therapy' and 'Physiotherapy' are characterized by the high percentages of their graduates who have part-time jobs, in addition to which only a comparatively small percentage of graduates from the first of these fields have a permanent appointment. Because there are relatively few opportunities of switching to other occupations, any worsening in employment levels can have serious effects on Higher Vocational Education graduates from Nursing and Paramedical Services.

Comparatively many graduates from social and cultural education at the level of Higher Vocational Education are unemployed, and if they do have a job this is often at a level lower than their education. The wage they earn is also comparatively low, which is closely related to the fact that they are more likely to work part-time. This applies especially to the discipline of 'Community, Welfare, and Residential Institution Work'. For the disciplines of 'Personnel Management' and 'Journalism, Librarianship, and Documentation' the percentage of graduates who do not have permanent appointments is comparatively high. The latter group is also characterized by a high percentage of freelancers and self-employed workers. On the other hand graduates from Social and Cultural education generally have jobs which correspond closely to the discipline they have studied, a factor which is also evident in the relatively limited potential flexibility offered by the disciplines of 'Personnel Management' and 'Community, Welfare, and Residential Institution Work'. Recent graduates from 'Higher Vocational Education, Teacher Training' find it rather difficult to find a permanent full-time job. Moreover, the income of those who do have a job is comparatively low, in part because of the large group who work part-time. However it is also true that graduates from 'Higher Vocational Education, Teacher Training' are generally employed in a job which corresponds to the level and discipline of their education. The risk position of graduates from this type of education is also comparatively favourable, because there are only slight fluctuations in employment levels and they have comparatively good labour market flexibility.

5. DISCUSSION

The earlier chapters of this report have outlined the most important changes which are expected in the labour market for the coming five years for the various occupational classes and types of education. In chapters 3 and 4 we have tried to give a nuanced picture of the labour market position of the various occupations and types of education, by examining the various facets of their current labour market position, risk position and future labour market position. The point of view throughout has been that of new entrants to the labour market, and, as regards the analysis by occupational classes, also of those seeking labour.

This closing chapter will look more closely at the significance of this labour market information for a number of current points of concern in policy-making in fields affecting both education and the labour market. We will proceed by look at five themes in policy-making:[28]

- vocational and educational guidance;
- school-leavers without a 'basic qualification';
- the increasing flows of graduates from higher education;
- the increasing numbers of students moving up through Intermediate Vocational Education to Higher Vocational Education and through Higher Vocational Education to University Education;
- the desired increase in the numbers of those with technical and engineering education entering the labour market.

Vocational and educational guidance

Labour market information for vocational and educational guidance should in principle relate to labour market prospects for the medium term, since this is the period in which those now facing educational choices will enter the labour market. If one simply takes the current situation in the labour market there is a risk of over-reaction to existing surpluses or shortages, so that, when graduation time comes, the labour market situation is entirely reversed. Information on the current labour market situation, such as data on current unemployment or the times taken to find a job (see also Arbeidsvoorziening, 1993), is thus not without its dangers and should generally play only a subordinate role in educational choices in initial education.

Current labour market data is however important for those who must decide at the end of their course whether to study further, and whose decision is to some extent dependent on their position in the labour market on the completion of their current education. For these students, labour market information on the various occupations is also valuable, so as to be able to form an picture of the occupational fields in which they will have the best chances of getting a job with their qualifications. This is especially important for school-leavers from types of education which offer many opportunities of switching to other occupational groups.

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28. We will not give a full overview in each case of all the training types which may be affected by a particular point of concern. A comprehensive overview can be formed from the *Statistical Supplement*.

As was noted above, for vocational and educational guidance, the expected labour market prospects in the medium term for each type of education are the most crucial labour market information. Information on these prospects can be supplemented with data on the long-term risk position of the type of education concerned, as expressed in the opportunities which it offers of switching to other occupations.[29] This information enables a student to choose an education which offers the most attractive combination of opportunities and risks on the labour market. The choice may fall for a course with favourable prospects, but with many risks due to the limited switching options and high sensitivity to cyclical fluctuations of the occupations to which that type of education generally leads. But one could also choose a course with less favourable prospects, but which offers many options for switching and relatively less marked employment fluctuations.

It will always be a personal choice, not only because individuals' ability to complete a course and personal preferences as regards opportunities and risks differ, but also because one's own market position is in part determined by personal factors. Labour market information presented in this report therefore amount to no more than general navigational data, comparable to the average winds and currents which may be found in a particular sea area in a particular season. The information provides a basis from which a personal course can be set, bearing in mind one's own preferences and potential.

The value of labour market information for individual educational and vocational choices thus lies mainly in improving allocation in the labour market, so that the expectations of students come somewhat closer to the reality which they encounter after graduation. Better anticipation of future developments in the labour market could also have the effect of dampening the notorious cobweb cycles which characterize educational choice behaviour.

From the information presented in this report on the labour market position of the various types of education it can be seen how diverse the labour market data is on this point. At every educational level there are types of education with good prospects, and others with moderate or bad prospects. Medical, technical and laboratory courses in Intermediate and Higher Vocational Education and at University level in many cases offer good prospects, although it must be noted that graduates from the medical and laboratory[30] courses often have few opportunities of switching to other occupations and are therefore strongly dependent on changes in the labour market in the health care sector. Good labour market prospects are also expected for 'Higher Vocational Education, Transport and Harbour', 'University Education, Theology' and 'Preparatory Vocational Education, Agriculture'. In contrast, the outlook for graduates from University Education in 'Fine Arts', 'Agriculture' and 'Arts', for school-leavers from 'Intermediate Vocational Education, Social and Cultural' and 'Senior General Secondary Education' and for drop-outs from General Secondary Education and Preparatory Vocational Education is bad.

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29. These two elements are also at the focus of the concise categorization of the labour market prospects for each type of training (see table 25 of the *statistical supplement*).

30. Including, at the higher levels, Pharmacy.

School-leavers without a basic qualification

School-leavers who leave their initial education without a 'basic qualification' are one important area of concern as regards the match between the education system and the labour market. Everyone who leaves their initial education without a vocational qualification at at least the level of an apprenticeship or Shorter Intermediate Vocational Education is in this model seen as a premature school-leaver. This would also include school-leavers with only a diploma from Preparatory Vocational Education or General Secondary Education. Within this group a 'hard core' of unskilled school-leavers is generally differentiated. These are the pupils who leave initial education without even a Preparatory Vocational Education or General Secondary Education certificate (see Ministerie van Onderwijs en Wetenschappen, 1993c).

The forecasts of expansion demand in the period 1993-1998 show that the labour market position of school-leavers without a basic qualification is very much under pressure, since employment is contracting for all types of education below the basic qualification level. The only groups for which an increase in employment is expected are the school-leavers from 'Senior General Secondary Education' and 'Preparatory Vocational Education, Security'.[31] In fact the fall in employment is by far the most marked for the 'hard core' of unskilled school-leavers. On the other hand the number of school-leavers without a basic qualification is also generally quite low, while the future replacement demand is very changeable.

One cannot lump all school-leavers without a basic qualification together. The labour market prospects for school-leavers without any Preparatory Vocational Education or General Secondary Education certificate are indubitably bad, so that it is certainly desirable for pupils in Preparatory Vocational Education and Junior General Secondary Education to complete their education with some sort of certificate. But school-leavers from 'Senior General Secondary Education', despite the expected increase in employment, also face a bad future labour market position. In contrast, the labour market prospects of school-leavers from 'Preparatory Vocational Education, Agriculture' are good, as the result of the limited flows of new entrants having this educational background and the high replacement demand due to the retirement etc. of older workers.

For new entrants to the labour market from the types of education 'Junior General Secondary Education', and for Preparatory Vocational Education in 'Community Care, Hotel and Catering', 'Transport and Harbour' and 'Security', the labour market prospects can be characterized as reasonable. For the first two of these types of education, this is mainly the result of the high replacement demand, but the need for replacements is to a significant extent due to the high exit rate of relatively young workers. This indicates that it may be very difficult for new entrants with this educational background to maintain their position in the labour market, since they end up in jobs with no possibilities of promotion, and in which they soon become too expensive in comparison with subsequent cohorts of new school-leavers. This indicates that it

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31. This type of training is not offered in regular day-time education.

would also be advisable for the school-leavers from these types of education to get a basic qualification by continuing their education under the apprenticeship scheme.

The increasing flows from higher education

As was noted in chapter 4, doubts as to the extent to which the labour market will be able to absorb the rapidly growing supply of people with higher education have increasingly been expressed in recent years. From the figures for job vacancies which were presented in chapter 4 it would seem that the vacancy rates for the occupational classes in which many people with higher education are employed are quite low. But it must be noted that vacancies in government institutions, in which many of those with higher educational qualifications are employed, have not been considered here. It is in general questionable whether job openings for those with higher education are adequately measured by vacancy surveys. Where employers can draw on open applications which they have kept on file, which is the case as regards the higher functions in many large concerns, there will often be no question of a vacancy standing open (Van Bastelaer and Laan, 1993).

The unemployment rates which were presented in section 4.4 for recent graduates from Higher Vocational Education show that the seriousness of the unemployment problem differs very much between the various disciplines within Higher Vocational Education. The same applies for the degree to which qualifications are under-utilized. Unfortunately no comparable data is available for University Education. There is however comparable data available on the flow of graduates into the labour market. The forecasts of the flows of new entrants to the labour market show that in the coming five years, for most types of education within University Education, the numbers of graduates entering the labour market will again be high. The only exceptions in this respect are the University courses in 'Theology', 'Veterinary and Medical Sciences and Dentistry' and to a slightly lesser degree 'Teacher Training' and 'Mathematics and Natural Sciences'. In contrast, for most types of education within Higher Vocational Education high labour market flows are not expected, due in part to the increasing numbers of graduates who do not enter the labour market, but rather move on into University Education (see Ministerie van Onderwijs en Wetenschappen, 1993b). Of all the types of education within Higher Vocational Education, only 'Agriculture', 'Business Administration Technology' and 'Nursing and Paramedical Services' are expected to produce high flows of new entrants to the labour market.

If the forecasts of the flows entering the labour market are set against the future job openings for those with higher education, it can be seen that the absorption problems will be limited to a few types of education. Within University Education, bad labour market prospects are expected for three types of education: 'Fine Arts', 'Agriculture' and 'Arts'.[32] For all three types of education, the bad outlook is largely due to the relatively high flows of new entrants to the

32. However the labour market prospects of the various disciplines within these types of education differ.

labour market. For 'University Education, Agriculture', moreover, the replacement demand is comparatively low. The labour market prospects for 'University Education, Law and Public Administration' and 'University Education, Social Sciences' could be characterized as moderate. Although there is a relatively large expansion demand for the latter two types of education, the labour market prospects for these types of education are very much under threat because of the low replacement demand and also because of the especially high flows of new entrants to the labour market. All in all, the types of education within University Education which have moderate or bad labour market prospects relate in total to more than 50% of the expected flows of academically trained new entrants to the labour market.

None of the types of education within Higher Vocational Education have labour market prospects which could be called bad, and only three types of education face moderate labour market prospects: 'Agriculture', 'Business Administration Technology' and 'Fine Arts'. For the first two of these, the moderate prospects are largely attributable to the high flows of new entrants to the labour market. For 'Higher Vocational Education, Business Administration Technology' there is also a low replacement demand.

As against these types of education with bad or moderate labour market prospects, a rosier future labour market situation is forecast for new entrants from a number of types of education within higher education. Within University Education, four types of education have good prospects: 'Mathematics and Natural Sciences', 'Veterinary and Medical Sciences and Dentistry', 'Medical Laboratory'[33] and 'Theology'. For the last of these, the good labour market prospects are mainly due to the high need for replacements and the low flows of new entrants to the labour market. For 'University Education, Veterinary and Medical Sciences and Dentistry' the expected flows of new entrants are also comparatively low. For 'University Education, Mathematics and Natural Sciences' and 'University Education, Medical Laboratory', in contrast, the good prospects result especially from the expected high expansion demand.

Within Higher Vocational Education, good prospects are expected mainly for engineering and laboratory education and transportation education. For 'Higher Vocational Education, Transport' the flows of new entrants will be very low, while many jobs will be available to new entrants to the labour market, mainly as a result of the high replacement demand. For 'Higher Vocational Education, Engineering', also, there is a relatively high need for replacements. For 'Higher Vocational Education, Non-medical Laboratory' the good outlook is especially attributable to the relatively low flows of new entrants to the labour market.

As was indicated in chapter 4, it is important to consider the risk position of the various types of education when assessing their labour market positions. On this point there are also large differences between the types of education which have been distinguished within higher education. It is especially striking that the opportunities which the graduates from types of education focusing on the health care sector have of switching to other occupational groups are

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33. This is largely Pharmacy.

very limited. The same applies, although generally to a more limited degree, for University Education in 'Teacher Training', 'Arts' and 'Theology'. The strong links between these types of education and an occupational field which is often sharply defined means that their labour market prospects are very sensitive to fluctuations in the number of job openings for new entrants to the labour market, and to the cobweb cycles which can result.

The increasing numbers of students moving up to higher education

In recent years there has been an increasing tendency for graduates from Intermediate Vocational Education to move on to Higher Vocational Education and for Higher Vocational Education graduates to go on to university. One of the reasons of this increasing 'stacking' of courses could be that graduates, finding that the labour market situation for the course they have just completed is bad, prefer to go on to a higher level of education. This will occur even more if workers with higher education are seen to be crowding those with lower-level education out of their traditional occupational fields.

This motivation applies at any rate for those coming from Senior General Secondary Education and University Preparatory Education, for which the future labour market position is certainly bad. These bad prospects appear to be caused to a large degree by a negative selection process. This group in fact consists of the school-leavers who do not undertake education in higher education, plus the drop-outs from higher education. Moreover this negative selection process is self-reinforcing because more and more students want to move on to University Education or Higher or Intermediate Vocational Education. This means that students with a certificate from Senior General Secondary Education choose to go on to Intermediate Vocational Education and students with a certificate from University Preparatory Education go to Higher Vocational Education, and later, if they succeed in these courses, carry on to Higher Vocational Education and University Education respectively. Because of the limited information which is available on current unemployment levels for the various types of education, their long-term prospects and the wage differentials, we will not consider whether the labour market data would indicate that it is sensible for individual students who have recently completed their Intermediate or Higher Vocational Education to go on to a higher education.

The labour market information presented in this report does enable us to form an opinion as to whether the movement from Intermediate Vocational Education to Higher Vocational Education, and from Higher Vocational Education to University Education, in the coming five years can be seen as favourable in relation to the goal of a more balanced labour market. Our verdict on this point will be based on a comparison of the expected labour market prospects of corresponding courses in Intermediate and Higher Vocational Education and University Education.[34] No account will be taken of the specific positive and negative effects of students' avoidance of uncertainty by following 'inefficient study careers'.

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34. These expectations are in part based on the *Referentieraming 1993* from the Ministrie van Onderwijs en Wetenschappen (1993b), in which a steady increase is expected for the coming years in both the flows from Intermediate Vocational Education to Higher Vocational Education and the movement from Higher Vocational Education to University Education.

For 'Intermediate Vocational Education, Engineering', the expected labour market prospects have been characterized as moderate, while 'Higher Vocational Education, Engineering' is expected to offer good prospects. Similarly, for new entrants to the labour market with an intermediate Vocational Education in Commerce and Administration the outlook is no more than moderate, while Higher Vocational Education in the same field is expected to offer reasonable prospects. Finally, those who move up from 'Intermediate Vocational Education, Social and Cultural' to the equivalent Higher Vocational Education course can improve their labour market prospects from bad to reasonable. Thus if the numbers of those with Intermediate Vocational Education certificates who go on to Higher Vocational Education should be higher than was assumed in the *Referentieraming 1993* (Ministerie van Onderwijs en Wetenschappen, 1993b), this would have to be seen as favourable for the labour market, at least as regards the two largest types of education, 'Intermediate Vocational Education, Engineering' and 'Intermediate Vocational Education, Commercial and Administrative' and also for the somewhat smaller type of education 'Intermediate Vocational Education, Social and Cultural'.[35] For the other types of education within Intermediate Vocational Education, increasing flows from Intermediate Vocational Education to Higher Vocational Education are, for the labour market, unfavourable.

A comparison of the expected labour market prospects for corresponding courses in Higher Vocational Education and University Education indicates that increasing flows from the former to the latter would not be favourable for the labour market. Because of their expected bad or moderate labour market prospects, increasing flows of graduates from Higher Vocational Education to the university courses in 'Arts', 'Agriculture', 'Fine Arts', 'Law and Public Administration'[36] and 'Social Sciences'[37] would be unfavourable for the labour market.

All in all we can say that the internal flows from Higher Vocational Education to University Education need to be looked at critically in the light of the goal of a more balanced labour market. In contrast, increasing flows from Intermediate to Higher Vocational Education, can, especially for engineering education, be seen as a positive development on the basis of the expected medium-term movements in the labour market.

The desired increase in labour market entrants with technical education

In recent years it has frequently been suggested that the reduced interest of young people in technical education may make it impossible to achieve the knowledge-intensive economic development which is so important for the international competitiveness of the Netherlands. An adequate supply of people with technical education would, according to this train of thought, stimulate the demand for technically trained labour (see also Centraal Planbureau, 1993b).

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35. It must however be noted that more specific labour market forecasts for the apprenticeship scheme, which is included here in Intermediate Vocational Education, indicate that various sectors will have to cope with a shortage of new apprentices in the coming years (see De Grip, Berendsen, Borghans and Dekker, 1993).

36. From the corresponding course 'Higher Vocational Education, Administrative, Legal and Fiscal'.

37. From the corresponding Higher Vocational Education course, 'Social and Cultural'.

One important reservation must be made before we discuss this point on the basis of the labour market information which has been presented in this report. The labour market forecasts presented here in fact relate only to the medium term. Because of the high sensitivity of the employment in many technical occupations to fluctuations in the business cycle, these cyclical swings can significantly obscure the more structural developments. An adequate analysis of the degree to which the supply of technically educated personnel may in the long term fall short of what is required to maintain international competitiveness can only be based on long-term forecasts (see for example Berendsen, De Grip and Willems, 1991). Another crucial reservation is that the technical types of education, with the exception of the laboratory courses, are in this report unavoidably aggregated at each educational level into a single type of education, which is usually very large. This makes it impossible to map out any differences between the labour market positions offered by the various disciplines.

The forecasts of the flows of new entrants to the labour market for the coming five years show that only 'Preparatory Vocational Education, Technical' and 'Intermediate Vocational Education, Non-medical Laboratory' are expected to produce low flows of new entrants to the labour market. For 'University Education, Engineering', as for many other types of education within University Education, there may even be a relatively high flow of new entrants to the labour market. However the forecasts of labour market prospects, in which the flows of new entrants are matched with the expected number of job openings, show that in the medium term, particularly for the higher levels of technical education, some problem areas can be expected to emerge in the labour market, in the sense of a shortage of new entrants. This is in fact the mirror image of the expected good labour market prospects of the types of education 'Higher Vocational Education, Engineering', 'Higher Vocational Education, Non-medical Laboratory', 'Higher Vocational Education, Transport and Harbour' and 'University Education, Mathematics and Natural Sciences'. For 'University Education, Engineering', the labour market prospects have been characterized as reasonable. Prospects in the labour market are also good for 'Intermediate Vocational Education, Non-medical Laboratory'. In contrast, for 'Intermediate Vocational Education, Engineering' and Preparatory Vocational Education, Technical' prospects are expected to be no more than moderate.[38] Thus in the medium term the only clear problem areas which are expected in the labour market are for those with higher technical education. Given the great importance of education in this category for the economy's capacity for innovation and for technological assimilation, this might be a threat to the international competitiveness of the Dutch economy.

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38. However, considering the strong sensitivity of the employment for technically trained people to fluctuations in the trade cycle, it is not impossible that the labour market position of the school-leavers from these training types may be subject to fluctuations during the forecast period.

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SOME CENTRAL CONCEPTS

Degree of ageing

An indication of the risk that, on the one hand, part of the experience in an occupational class will in the longer term be lost and, on the other hand, that future training costs will increase as a result of 'educational obsolescence'. The degree of ageing is measured as the percentage of workers in an occupational class who are 50 years old or older.

Dependence on school-leavers

The degree to which an occupational class is reliant on the flows of young people entering the labour market, measured as the percentage of those already working in an occupational class who are younger than 30.

Expansion demand

The demand for new workers which is attributable to growth in employment levels. If employment falls, the expansion demand is negative.

Publications:

L. Borghans, H. Heijke (1993a), *Een random-coefficienten model van het voorspellen van de beroepenstructuur van bedrijfstakken* (A random coefficient model for predicting the occupational structure of economic sectors) ROA-W-1994/1, Maastricht.

L. Borghans, H. Heijke (1993b), *Forecasting the Educational Structure of Occupations: A Manpower Requirement Approach with Substitution,* ROA-RM-1993/2E, Maastricht.

Flow of school-leavers onto the labour market

The supply of new workers entering the labour market, as determined by the expected flows of school-leavers leaving their initial full-time education, plus those completing part-time education courses, special forms of full-time education and vocationally-oriented adult education.

Publication:

H. Berendsen, R.J.P. Dekker, A. de Grip, P.J.E. van de Loo (1992), *Prognose arbeidsmarktinstroom van schoolverlaters per opleidingstype,* ROA-W-1992/2, Maastricht.

Future labour market prospects

The expected future labour market situation, which may become evident in unemployment or labour shortages or changes in, for example, wage differentials or the degree of under-utilization (i.e., over-education). The future labour market prospects for each type of education are determined by means of the indicator of the future labour market situation, defined as the ratio between the expected expansion and replacement demand on the one hand, and the expected flows of school-leavers entering the labour market plus the short-term unemployed, on the other hand. The higher the value of the indicator, the worse the prospects are.

Publication:

Hans Heijke (editor) (1994), *Forecasting the Labour Market by Occupation and Education,* Kluwer Academic Publishers, Boston/Dordrecht/London.

Job openings

The total demand for new workers, as determined by the growth in employment (positive expansion demand) and the replacement demand.

Publication:

Hans Heijke (editor) (1994), *Forecasting the Labour Market by Occupation and Education*, Kluwer Academic Publishers, Boston/Dordrecht/London.

Market position

The position which an occupational class or type of education holds, from the point of view of those seeking work or of those offering employment. The general position is compounded from the current market position, the future market position and the risk position. These components are explained further as separate items.

Occupations

All occupations have been grouped in a number of clusters. This report deals mainly with 93 occupational *classes.* These can be further aggregated into 10 occupational *sectors.* The most dissaggregated occupational classification used in this report, especially for determining the opportunities of switching to other occupations, is a classification into 318 occupational *groups.*

Publication:

P.J.E. van de Loo, R.J.P. Dekker, A. de Grip (1992), Arbeidsmarktsegmentatie als uitgangspunt voor een beroepenclassificatie, *Tijdschrift voor Arbeidsvraagstukken*, vol. 8, no. 1, pp. 19-31.

A. de Grip, L.F.M. Groot, J.A.M. Heijke, Defining Occupational Groupings by Educational Structure, in: *Environment and Planning A,* 1991, vol. 23, pp. 59-85.

Replacement demand

The demand for new workers attributable to the need to replace workers who retire, suffer employment disabilities or withdraw from the labour market. The replacement demand in an occupational class can also derive from occupational mobility.

Publication:

E.J.T.A. Willems, A. de Grip (1993), Forecasting Replacement Demand by Occupation and Education, *International Journal of Forecasting*, vol. 9, no. 2, pp. 173-185.

Risk position

The more or less structural vulnerability of occupations and types of education in the labour market. The risk position of occupational classes has been characterized on the basis of their dependence on school-leavers, the degree of ageing of their workforce, the sensitivity to fluctuations in the business cycle and the opportunities they offer of switching to other sub-sectors. The risk position of types of education has been characterized by means of the opportunities of switching to occupational groups at a corresponding or higher job level.

Sensitivity to business cycles

The degree to which the employment in an occupational class is sensitive to changes in the general economic situation. This indicator thus shows the degree of job security. The sensitivity to business cycles is determined by relating the fluctuations in sectoral employment in the past to the degree to which an occupational class is at present represented in the various economic sectors.

Publication:

Hans Heijke (editor) (1994), *Forecasting the Labour Market by Occupation and Education*, Kluwer Academic Publishers, Boston/Dordrecht/London.

Switching options

The degree to which workers with a particular educational background can find places in other occupational groups at a corresponding or higher function level, or, the degree to which those working in a particular occupation can find places in other sub-sectors. This is a measure of the extent to which workers are dependent on the labour market situation in a given occupation or a given economic sector. The switching options are determined with the aid of the Gini-Hirschman dispersion coefficient. This indicator is equal to 1 if the workers are evenly spread over all occupational groups, or over all sub-sectors. It is equal to 0 if they are totally concentrated in one occupational group or sub-sector.

Publication:

Hans Heijke (editor) (1994), *Forecasting the Labour Market by Occupation and Education*, Kluwer Academic Publishers, Boston/Dordrecht/London.

Types of education

All recognized types of education are aggregated into a number of clusters. This report deals mainly with 49 *types of education.* These can be further aggregated into 11 *educational categories*, as defined by the Central Planning Bureau. In chapter 4, a more differentiated categorization of Higher Vocational Education produces 27 *disciplines.*

Abbreviations: PVE = Preparatory Vocational Education; IVE = Intermediate Vocational Education; HVE = Higher Vocational Education; UE = University Education.

Under-utilization (overeducation)

An indication of the degree to which workers are employed at a level that is lower than their educational level. Two measures are employed: the first compares workers' educational level with a more or less objective assessment of the level of their jobs. The other is created by asking workers themselves whether their education corresponds with the job they perform.

Publications:

Hans Heijke (editor) (1994), *Forecasting the Labour Market by Occupation and Education*, Kluwer Academic Publishers, Boston/Dordrecht/London.

Unemployment

Three definitions of unemployment must be distinguished, the *unemployed working population*, data on which is presented in chapter 1, *registered unemployment*, which is used

for characterizing the current market position of school-leavers, and the *work seekers without a job,* the definition which is applied in the forecasts.

The unemployed working population includes all those who do not work or who work less than 12 hours, and who:

- have accepted employment which will entail at least 12 hours of work per week;
- declare that they are willing to work at least 12 hours per week, are available to do so, and are active in seeking at least 12 hours' work per week.

Registered unemployment includes those between the ages of 16 and 64 years old who:

- are registered with the Labour Department;
- do not have work, or work less than 12 hours per week;
- are available for a job of 12 hours or more per week or have accepted a job which will entail at least 12 hours work per week.

The unemployment rate is determined by relating the number of unemployed to the working population.

The 'work-seekers without a job' comprise those who have no employment and who:

- are actively seeking work, other than merely be registering with the Labour Department, and are also available to accept employment;
- have accepted an appointment, but have not yet begun work.

Publication:

Centraal Bureau voor de Statistiek (1993), *Enquête Beroepsbevolking 1992* (Labour Force Survey 1992), Voorburg/Heerlen.

Vacancy rate

The total number of unfilled vacancies in an occupational class as a percentage of the number of workers in the corresponding occupational class.